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BULLETIN
OF THE
AGRICULTURAL AND MECHANICAL
COLLEGE OF TEXAS

THIRD SERIES, VOL. 4

OCTOBER 15, 1918

No. 20

TWENTY-FIRST BIENNIAL REPORT
OF THE
AGRICULTURAL AND MECHANICAL COLLEGE
OF TEXAS



For the Fiscal Years Ending August 31, 1917, and
August 31, 1918

OMITTING FINANCIAL STATEMENT

Published Monthly by the Agricultural and Mechanical College
of Texas

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Published Monthly by the Agricultural and Mechanical College
of Texas

BOARD OF DIRECTORS.

JOHN I. GUION, President.

L. J. HART, Vice-President.

Terms Expire 1919.

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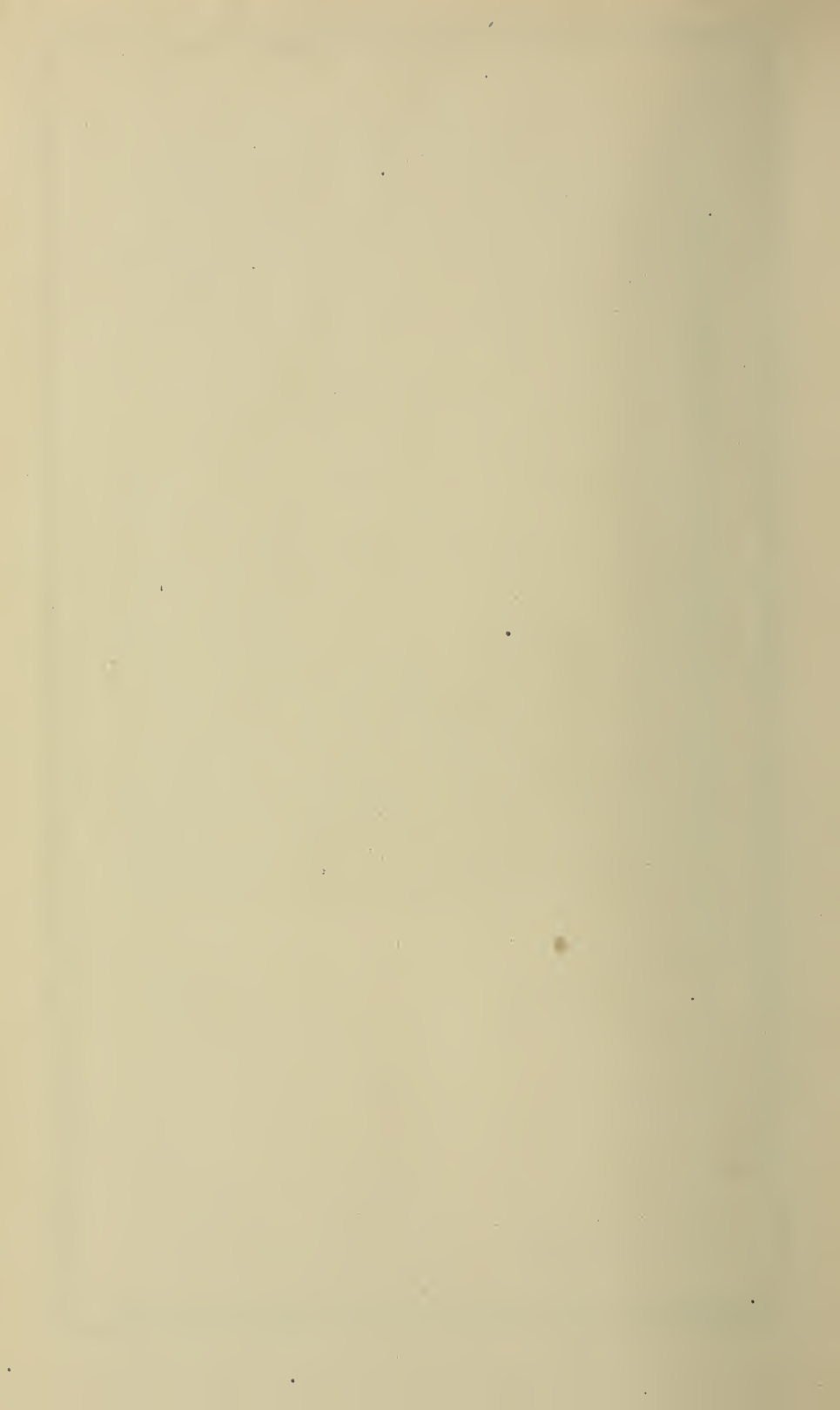
F. M. LAW..... Houston.

H. A. BREIHAN..... Bartlett.

JOHN T. DICKSON..... Paris.

DAVID WENDEL SPENCE

Born September 22, 1868; died June 28, 1917. B. Sc., University of Texas, June, 1889; C. E., University of Michigan, June, 1891. Student Assistant, Department of Physics, University of Texas, session 1888-89. Appointed Assistant Professor of Civil Engineering and Physics and Drawing, Agricultural and Mechanical College of Texas in July, 1892; appointed Associate Professor of Civil Engineering and Physics, and of Drawing, June, 1898; appointed Professor of Physics, July, 1899; appointed Associate Professor of Civil Engineering, June 8, 1903; in June, 1906, given additional duty as Supervising Architect; in 1907-8 given additional duties as Consulting Engineer for Prairie View State Normal and Industrial College; in May, 1908, appointed Professor of Structural Engineering, Superintendent of Repairs and Consulting Engineer for Prairie View; in August, 1912, appointed Professor of Structural Engineering and Supervisor of Construction; in August, 1913, appointed Professor of Civil Engineering and Dean of Engineering.



CONTENTS.

	PAGE
1. Report of the President of the College.....	7
2. Report of the Dean of the College.....	30
3. Report of the Dean of the School of Engineering.....	33
4. Report of the Dean of the School of Agriculture.....	38
5. Report of the Dean of the School of Veterinary Medicine....	45
6. Report of the Director of the Texas Agricultural Experiment Station	48
7. Report of the Director of the Texas Engineering Experiment Station	70
8. Report of the Director of the Extension Service.....	72
9. Report of the Department of Military Science and Tactics...	102
10. Report of the Athletic Department.....	105
11. Report of the Summer Schools.....	115
12. Report of the Farmers Short Course.....	118
13. Report of the Farmers Congress.....	122
14. Report of the Religious Activities.....	123
15. Report of the Director of War Educational Activities.....	124
16. Report of the Department of Publicity.....	132
17. Report of the Librarian	134
18. Report of the Superintendent of Buildings and Grounds....	135
19. Report of the State Chemist.....	138
20. Report of the State Forester.....	140
21. Report of the Legislative Investigating Committee.....	143
22. Report of the Superintendent of the Power Plant.....	154
23. Report of the College Laundry.....	156

LETTER OF TRANSMITTAL.

September 1, 1918.

To His Excellency, W. P. Hobby, Governor of Texas; to the President and Members of the Texas State Senate; to the Speaker and Members of the House of Representatives, Austin, Texas.

GENTLEMEN: In compliance with the law I submit herewith the following report of the Agricultural and Mechanical College of Texas for the biennium ending August 31, 1918. Your attention is respectfully invited to the reports of the President of the College, the deans and directors and other officers, which is herewith transmitted for your information and consideration. The progress, policies and needs of the institution are carefully outlined in the reports of these officers.

It affords me great satisfaction on behalf of the Board of Directors to advise you that the College continues to serve the educational needs of Texas in a very effective way. The conditions created by the war have made it necessary to greatly modify the work of the institution during a large part of the period covered by this report. The problems created by the war have clearly demonstrated the wisdom of our forefathers in establishing this institution and providing for technical training for young men in agriculture, the various industrial branches and military science and tactics. The College has been able to serve the nation in a large way through the well equipped men who have been called to the nation's need in time of war. More than two thousand of the sons of the Agricultural and Mechanical College have enlisted in the army and navy of the United States and more than forty of these have paid the supreme sacrifice for the cause of social justice and human freedom. The College, during the period of the war, has trained several thousand men for technical branches of the army.

The Board of Directors takes pride in the contribution the College has made to the war aims of the nation and it submits this record to the people of Texas with the firm conviction that it will be gratifying to the citizens of Texas to know something of this record of achievement.

The business affairs of the institution are in splendid condition, as you have seen from the reports of the auditors, which is herewith submitted as "Part Two" of this biennial report. On the authority of the Board of Directors I employed the John K. Breeden Company of Houston, Texas, to audit the books of the College for the fiscal year 1916-1917 and Marwick, Mitchell, Peat and Company of Dallas for the year 1917-18. Both of these firms are well known commercial auditing firms and the audits they have made of the College books indicate that the work has been thoroughly done. As you will see from the financial reports that have been made, the College has incurred no deficiencies except those authorized by the Governor in a legal way. You will thoroughly appreciate the difficulty in financing the College and its branches during the period covered by this report. Estimates that were submitted to the Legislature more than a year before our advent into the war were based upon prices at the time they were made. Since that

time practically every kind of commodity has greatly increased in price, which made our former estimates too low. This has created a very serious financial problem for the College authorities. But every possible effort has been made to bring the expenditure within the appropriations, and the success of this is indicated by the fact that only three deficiencies have been required to meet the situation.

Your attention is directed to one or two quotations from the very comprehensive report of John K. Breeden & Co.:

"The magnitude of this institution, and the operations connected with it, are manifestly of proportions, we dare say, unknown to many of the citizens of the State of Texas, but to those directly interested and engaged in the work, a realization of this statement is probably appreciated."

The magnitude of the College is indicated by another statement from these accountants that shows that the value of the College plant was \$2,727,492.38 at the time their audit was made. During the year 1916-17, the period covered by this audit, the value of the College plant was increased by \$524,667.50 by the erection of new buildings and the construction of other permanent improvement. This report concludes as follows:

"The various departments appear to be in accord in business relations, and appear to be striving, by industrious application to their work, to maintain and improve the high standard of efficiency. With such conditions prevailing, there is no reason why the College could not grow into a greater usefulness to the people of the State."

On behalf of the Board of Directors I invite the most careful scrutiny to the financial transactions of the College and its branches. The Board of Directors appreciates its responsibility to the public in the expenditure of funds derived from taxation. All estimates that have been submitted to the Governor and the Legislature by the College authorities have been carefully made and every possible effort has been exerted to see that these funds were wisely expended and that full value was received for the amount expended, either in service or construction. As President of the Board of Directors it is my firm conviction that the affairs of the College have been honestly administered and that business methods have been applied in the policies of the institution. It is upon this record that we base our claims for the continued support of the group of colleges whose affairs we have the honor to direct.

Your attention is directed to the needs of the College as outlined in President Bizzell's report. The Board has given careful consideration to every item that has been included in the budget which is submitted herewith, and we are convinced that every item is urgently needed and that the estimates are based upon careful calculations. I especially call your attention to the need of a library building, which is designed to be a memorial to the brave sons of the College who have paid the supreme price of the war and to the hundreds of others who have enlisted in the army and navy. A library is urgently needed at the College, and we believe that this building can adequately serve a double purpose if funds are provided for its erection. The College has requested an appropriation for an agricultural building to several subsequent Legislatures but for various reasons the funds have not been

provided. The time has come when this building must be secured if the cause of agricultural education in Texas is to be promoted. It is earnestly hoped that the Legislature will give due consideration to all the needs of the institution based upon the record it has made and the possibilities of service that it will render in the future.

Your attention is directed also to the reports of the Director of the Extension Service and of the Director of the Experiment Station. These divisions of the College have shown commendable progress and the work they have accomplished as indicated in these reports is highly gratifying.

The reports of the State Forester and State Chemist are also made a part of this report by virtue of the fact that the law establishing these offices makes it the duty of the Board of Directors of the College to appoint those who fill them. The State Chemist has been identified with the College for a number of years and his work is known and highly valued throughout the entire country. The present State Forester has been in the service for less than a year, having succeeded Mr. J. A. Foster, who resigned to enter private business in another State. The results already obtained by this officer have fully vindicated the Board of Directors in his selection and the work that is being done deserves the approval of the people of Texas and the financial support of the Legislature.

Several changes have taken place in the Board of Directors during the present biennium. Colonel J. Sheb Williams has been succeeded on the Board by Hon. John T. Dickson, of Paris; Hon. F. M. Law, of Houston, was appointed to succeed Mr. T. E. Battle, of Marlin. In this connection I wish to express my appreciation for the cordial support that the Board has given me during the period of my service as President of the Board. There has been complete co-operation at all times between the members of the Board and the President of the College. All have worked together harmoniously with the common aim of serving the institution as effectively as possible. It has been a real joy to me to be associated with this group of men. I cannot commend too highly the service of Dr. Bizzell, President of the College.

In conclusion permit me on behalf of the Board to express our appreciation for the co-operation that you have given us and the President of the College in the responsible duties of directing the affairs of this institution.

We bespeak your co-operation in presenting to the Legislature the needs of the great institution and its branches which we represent and we assure you in advance that we will exercise every possible effort to justify the confidence you have imposed in us and the assistance that you render.

Respectfully,

JOHN I. GUION,
President of the Board of Directors.

REPORT OF THE PRESIDENT OF THE COLLEGE.

September 1, 1918.

To the President and Members of the Board of Directors of the Agricultural and Mechanical College of Texas.

GENTLEMEN: I have the honor to submit herewith the following report for the years 1916-17 and 1917-18, together with certain recommendations concerning the future policies of the institution and a report setting out the needs of the college for the years 1919-20 and 1920-21, to which I invite your most careful attention.

I am also submitting the report of the Deans, Directors and other officers of the college and its branches, which are included in and made a part of the Twenty-first Biennial Report of the institution. A careful reading of the various reports included herein will indicate the scope of the activities of the college and give an intelligent survey of the accomplishments of the respective divisions of the college work.

I.

ENROLLMENT.

The College enrollment continues to increase year after year in a normal and satisfactory manner. The following shows the distribution of students by sessions and by courses for the period covered by this report:

	1916-17	1917-18
Regular session	1242	1152
Summer session	525	1132
Total.....	1767	2284

The facts indicate that there was a slight decrease of attendance during the regular session of 1917-18 due to the influence of the war, but the total enrollment for that year exceeded the total enrollment for the preceding year by 517 students, due to the large increase in the Farmers Short Course in the summer of 1917. While not logically a part of this report, it will probably be of interest to know that the total enrollment during the first few weeks of the scholastic year 1918-19 was 1560. This is lightly abnormal, due to the unusual advantages extended by the Federal government through the Committee on Education and Special Training of the War Department. It was necessary to limit the attendance in September of 1918 to approximately 1500 students, due to the fact that more than two thousand soldiers were in training here and the facilities of the college are very definitely restricted, due to limited dining and rooming facilities. However, there is every reason to believe that the attendance in the future will always be as large as the facilities of the college will permit.

Your attention is directed to the report of the Dean for a more detailed analysis of the College enrollment for the period covered by this report.

PROGRESS AND CHANGE.

The period covered by this report has been marked by continued progress, but the conditions created by the war have produced many changes in policy and internal organization. The College was but slightly influenced by war conditions during the scholastic year of 1917-18, due to the fact that war was not declared until near the close of the session. However, most of the students in the senior class withdrew before the end of the session in order to enter an officers training camp. But the under classes were not seriously affected by war conditions. It is remarkable that the attendance has not been seriously affected by war conditions. At no period in the history of the College has there been manifested a greater spirit of co-operation between the officers and instructors of the College, and the student body has at all times been loyal to the best interests and the best traditions of the institution.

RESIGNATIONS.

The following professors and instructors have resigned within the period covered by this report:

Charles H. Arndt, Instructor in Biology, resigned to go into government work.

F. W. Bell, Associate Professor of Animal Husbandry, resigned to accept similar position in Kansas A. and M. College.

O. Brown, Assistant Professor of Horticulture, resigned to go into the army.

L. B. Burk, Associate Professor of Animal Husbandry, resigned to go into government work.

J. D. Blackwell, Associate Professor of Agricultural Education, resigned to accept a position with the Board for Vocational Education, Austin.

E. G. Campbell, Assistant Professor of Biology, resigned to enter school.

O. F. Chastain, Professor of History, resigned to go into army Y. M. C. A. work.

J. A. Clutter, Assistant Professor of Dairy Husbandry, resigned to accept a similar position in Clemson College, North Carolina.

B. K. Coghlan, Associate Professor of Highway Engineering, resigned to go into army work.

I. E. Cowart, Assistant Professor of Horticulture, resigned to become superintendent of an experiment substation.

C. H. Farr, Assistant Professor of Biology, resigned to go into government work.

Darden Ford, Director of Music, resigned to go into army Y. M. C. A. work.

J. H. Foster, Professor of Forestry, State Forester, and Forester for the Experiment Station, resigned to go into private business.

E. C. Gee, Professor of Agricultural Engineering, resigned to go into the banking business.

H. B. Gordon, Associate Professor of Chemistry, accepted another position.

C. E. Hanson, Instructor in Mechanical Engineering, resigned to go on the farm.

J. A. Harrington, Assistant Professor of Mechanical Engineering, resigned to accept a similar position in another university.

H. E. Hayden, Associate Professor of Biology, resigned to accept a similar position in the University of New York.

J. E. Kimlel, Instructor in Chemistry, resigned to go into government work.

J. H. Lowe, Assistant Professor of Biology, resigned to go into army work.

J. P. Magnuson, Instructor in Chemistry, resigned to go into government work.

G. G. Martinson, Instructor in Mechanical Engineering, resigned to farm.

R. Mathews, Instructor in Drawing, resigned to accept a similar position in the A. and M. College of Mississippi.

G. W. Mullen, Instructor in English, resigned to accept a similar position in the University of New York.

Rexford Newcomb, Acting Professor of Architecture, resigned to accept similar position in the University of Illinois.

I. C. Nichols, Assistant Professor of Mathematics, resigned to become Professor of Mathematics in the Louisiana State University.

J. B. Overstreet, Instructor in Chemistry, resigned to go into government work.

E. L. Reed, Assistant Professor of Biology, resigned to accept a position at John Tarleton Agricultural College.

E. B. Reynolds, Instructor in Agronomy, resigned to become superintendent of an experiment substation.

D. R. Semmes, Associate Professor of Geology, resigned to go into commercial work.

F. J. Skeeler, Instructor in Physics, resigned to enter army work.

W. G. Smith, Assistant Professor of Electrical Engineering, accepted a similar position in another university.

C. F. Sparkman, Assistant Professor of Modern Languages, resigned to accept a similar position in another university.

C. S. Tatum, Associate Professor of Textile Engineering, resigned to accept commercial work.

C. C. Whitney, Assistant Professor of Veterinary Medicine, resigned to go into army work.

A. B. Wilcox, Accountant, resigned to go into army work.

G. P. Wilson, Instructor in English, accepted work in another institution.

W. Wipperman, Assistant Professor of Mechanical Engineering, went into army work.

Louis H. Wright, Assistant Professor of Physiology and Pharmacology, resigned to accept a similar position in another institution.

M. H. Young, Instructor in Agronomy, resigned to go into the railroad business.

CHANGES IN RANK.

The following promotions and changes in rank have been approved by the Board during the period covered by this report:

Action of Board, June 29, 1917:

W. A. Broyles—From Assistant Professor to Associate Professor of Agricultural Engineering.

W. T. Bryant—From Instructor to Assistant Professor of Chemistry.

E. G. Campbell—From Instructor to Assistant Professor of Biology.

H. E. Hayden—From Assistant Professor to Associate Professor of Biology.

E. L. Reed—From Instructor to Assistant Professor of Biology.

E. B. Reynolds—From Instructor to Assistant Professor of Agronomy.

C. F. Sparkman—From Instructor to Assistant Professor of Modern Languages.

Action of Board, August 30, 1918:

S. W. Bilsing—From Acting Professor to Professor of Entomology.

R. E. Bosque—From Assistant Instructor to Instructor in Agricultural Engineering.

Hugh Cassiday—From Assistant to Associate Professor of Biology.

T. J. Conway—From Assistant to Associate Professor of Poultry Husbandry.

G. A. Geist—From Assistant to Associate Professor of Drawing.

R. M. Green—From Assistant to Associate Professor of Civil Engineering.

W. G. James—From Assistant to Associate Professor of Electrical Engineering.

E. Langford—From Instructor to Assistant Professor of Drawing.

S. A. McMillan—From Associate Professor of Agronomy to Professor of Farm Management.

W. T. Magee—From Assistant to Associate Professor of Animal Husbandry.

A. T. Potts—From Associate Professor of Horticulture to Professor of Vegetable Gardening.

I. J. Sheppard—From Assistant to Associate Professor of Electrical Engineering.

J. J. Richey—From Associate Professor of Civil Engineering to Professor of Structural Engineering.

W. L. Stangel—From Instructor to Associate Professor of Animal Husbandry.

L. P. Thomas—From Dairyman to Assistant in Dairying.

H. C. Yingling—From Instructor to Assistant Professor of Entomology.

FACULTY APPOINTMENTS.

The following appointments to positions on the teaching staff have been authorized by the Board:

R. A. Andree, B. S., University of Wisconsin, M. S., Pennsylvania State College, Professor of Agricultural Engineering.

E. C. Baker, B. S., in Mechanical Engineering, Mississippi A. and M. Assistant Professor of Mechanical Engineering.

O. Brown, B. S., M. S., Alabama Polytechnic Institute, Assistant Professor of Horticulture.

N. S. Blackburn, D. V. M., Cornell, Assistant Professor of Veterinary Medicine.

C. W. Burchard, A. B., Allegheny College, A. M., University of Wisconsin, Assistant Professor of Chemistry.

M. L. Caldwell, A. B., Ouachita College, L. L. B., University of Texas, Instructor in English.

J. F. H. Douglas, S. B., Massachusetts Institute of Technology, Ph. D., Cornell, Assistant Professor of Physics.

L. B. Fields, B. S., in Electrical Engineering from Purdue University, Associate Professor of Industrial Education.

N. E. Fitzgerald, B. S., in Education, B. S., in Agriculture, University of Missouri, Associate Professor of Agricultural Education.

W. G. Keehn, D. V. M., from Kansas City Veterinary College, Assistant Professor of Veterinary Medicine.

J. E. Kimmel, Ph. C., Northwestern, Ch. E., from I. C. S., Scranton, Instructor in Chemistry.

Oscar N. Lackey, B. S., Valparaizo University, A. M., Trinity College, N. C., Instructor in Physics.

H. H. Laude, M. S., from A. and M. College of Texas, Assistant Professor of Biology.

John B. Leake, student of University of Missouri and University of Kansas, Electrical Engineering Course, Instructor in Drawing.

Charles Marten, B. S., Teachers College of Columbia University, M. A., Western Reserve University, Cleveland, Ohio, Associate Professor of Industrial Education.

M. A. Miller, B. A., M. A., University of South Carolina, Assistant Professor of English.

J. C. Nagle, B. S., M. A., University of Texas; C. E., Western University of Pennsylvania; M. C. E., Cornell, Dean of Engineering and Professor of Engineering.

Rexford Newcomb, B. S., University of Illinois; A. M., University of Southern California, Assistant Professor of Architecture.

W. L. Porter, A. B., from Howard College, Alabama, Assistant Professor of Mathematics.

E. Oscar Randolph, A. B., M. A., University of North Carolina, Associate Professor of Geology.

Edward F. Rathjen, Ph. D., Cornell, Associate Professor of Geology.

T. P. Raysor, A. B., Harvard, Instructor in English.

E. O. Seicke, B. A., University of Nebraska, B. S., in Forestry, University of Nebraska, Professor of Forestry, State Forester and Forester to the Experiment Station.

H. W. Small, A. M., Bates College, S. T. B., Grant University, Instructor in Mechanical Engineering.

W. A. Stone, S. B., University of Chicago, Instructor in Chemistry.

A. D. Suttle, B. S. A., Mississippi A. and M., Instructor in Agronomy.

G. E. Sutton, D. V. M., Kansas City Veterinary College, Field Veterinarian.

L. J. Voorhies, B. S., in C. E., Louisiana State University, Professor of Highway Engineering.

M. B. Walker, Instructor in English and Director of Music (Never entered upon his duties here).

A. E. Wood, B. S., Mercer University, M. S., Vanderbilt, Professor of Chemistry.

PERMANENT IMPROVEMENTS.

Many important improvements have been made within the period covered by this report. Your attention is directed to the report of the Superintendent of Buildings and Grounds for a list of the outside improvements and repairs. An extension of concrete walks, improved water and heating facilities and a better lighting system have added greatly to the comfort and contentment of the student body. The following buildings have been completed and occupied since my last biennial report was submitted to the Board:

Guion Hall, the new auditorium.

The Experiment Station Building.

The Power Plant Building.

Bizzell Hall, a new and modern fire-proof dormitory.

Francis Hall, the Veterinary Medical Building.

The completion of these buildings has greatly increased the facilities of the College and relieved the College authorities of some of the most pressing problems connected with housing and instruction of students.

It has been the desire of the College authorities to adapt each building as nearly as possible to the object that it is designed to serve. The architects have prepared the plans and specifications with the greatest possible care with this end in view. Two serious difficulties have confronted us in carrying out our building program.

(1) The estimates submitted to the Legislature were prepared upon the prices of material in 1916. There has been, as all know, a rapid increase in the prices of all structural material since that time, and this has made it exceedingly difficult to secure these buildings within the appropriation provided by the Legislature. But this has been done and no deficiencies have been asked for to complete any building at the College.

(2) It has been very difficult for the contractors to secure material within reasonable time. This has necessarily delayed the completion of the buildings in the normal time allotted in the contracts. The delays have resulted in some inconvenience, but under all the circumstances it could not be avoided.

I am convinced, however, that the State has received good values for the outlay of money and the buildings will fulfil their purposes at the College for many years to come.

STATE AND NATIONAL LEGISLATION.

The extension of the activities of the College and its relation to the Federal government naturally makes the need of State and Federal Legislation increasingly important. The Thirty-fifth Legislature passed several acts and considered several more that were vitally important to the College.

WEST TEXAS AGRICULTURAL AND MECHANICAL COLLEGE.

The regular session of the Thirty-fifth Legislature passed an Act establishing a branch of the Agricultural and Mechanical College of Texas in that portion of West Texas lying west of the ninety-eighth meridian and north of the twenty-ninth parallel. The Act provided for the location of this institution by a commission composed of the Governor of the State, the Commissioner of Agriculture, the Lieutenant Governor, the Superintendent of Public Instruction and Speaker of the House of Representatives. The government and direction of the policy of the institution was placed under the Board of Directors of the Agricultural and Mechanical College of Texas. While the Act nominally provided that this proposed institution should be a "branch" of this College, it provided in Section 6 that the Board of Directors "shall provide a course of instruction for said College covering substantially the same subject matter as that provided at the Agricultural and Mechanical College of Texas. * * * With such modifications as may be necessary to render such college most useful and of most practical benefit to the people residing in the territory" where the college was located. This provision of the Act created a serious question of policy of far-reaching importance. Should Texas establish two co-ordinate technical institutions with practically the same curricula and designed to serve the same ends? A careful study of the educational policy of the other States of the Union revealed the fact that this had not been done in any other State in the United States. There was fear on the part of many intelligent citizens that if this policy was established there would develop an unfortunate rivalry between the two institutions that would seriously affect the cause of education and result in strife between the two interested sections of the State that these two institutions might come to serve. But the issues involved in this problem were avoided by the first called session of the Thirty-fifth Legislature repealing the act.

JUNIOR COLLEGES.

The authorities of the Agricultural and Mechanical College have believed that additional agricultural educational facilities should be provided for Texas and they have advocated the establishment of a system of junior colleges carefully located in typical and characteristic sections of the State. It is believed that these institutions should be made organic parts of the Agricultural and Mechanical College by placing them under the governing board of the College and otherwise articulating them through administrative organization.

The Legislature partially adopted this policy by establishing the John Tarleton Agricultural College at Stephenville, Grubbs Vocational College at Arlington and the Northeast Texas Agricultural College.*

The citizens of Erath county tendered to the Legislature what was known as John Tarleton College, located at Stephenville, together with lands, buildings and money, which was accepted. The Act provides that the college shall rank "as a junior agricultural college, which, for the

*The Act creating the Northeast Texas Agricultural College was repealed by the first called session of the Thirty-fifth Legislature.

purposes of this act, is designated as an institution offering four-year courses, beginning with the junior year of a four-year high school and extending to and including the sophomore year of a standard four-year college. The institution is placed under the Board of Directors of the Agricultural and Mechanical College of Texas."

The Grubbs Vocational College, located at Arlington, was named in honor of Judge V. W. Grubbs of Greenville, who was instrumental in securing the passage of the Act establishing this institution. Its organization is slightly different from that of the John Tarleton Agricultural College, as provision is made for a local advisory board of five members who act under the general direction of the Board of Directors of the Agricultural and Mechanical College. The Act creating this institution also provides that this institution is mechanical and industrial as well as agricultural. The Board of Directors of the Agricultural and Mechanical College of Texas organized these institutions by directing that the President of the College should bear the same relation to these junior colleges that he bore to the Agricultural and Mechanical College, and provided that the local administrative officer at each institution should have the title of "Dean" and work in close co-operation with the President of the college system. This plan of organization has worked very satisfactorily and it will probably be the established policy in the organization of subsequent junior colleges that may be added to the system.

Both the John Tarleton Agricultural College and the Grubbs Vocational College opened in September, 1917, under very promising circumstances. The reports of the deans of these institutions are made a part of this biennial report for the information of the Board of Directors, the Governor, the members of the Legislature, and others interested in the cause of education.

COMMITTEE TO INVESTIGATE CONFLICT IN AGRICULTURAL AND EXTENSION WORK.

The constant rumors that there was conflict between the agricultural extension agencies in this State caused the Legislature to appoint a committee to investigate this situation. The resolution provided that the committee should be composed of two senators and three members of the House to be appointed by the President of the Senate and the Speaker of the House, "to investigate and determine under the Constitution and laws of Texas, the distinct and specific fields of operation to be pursued by each of said institutions, so as to avoid and eliminate the duplication and friction existing among said institutions." This committee called before it officials connected with the agencies and institutions conducting extension work in Texas. It was obvious from the testimony that there was duplication of effort by the State Department of Agriculture and Extension Service of the Agricultural and Mechanical College. However, it was shown that this College was conducting its extension work in co-operation with the State's Relation Service of the United States Department of Agriculture and that the scope of these activities was determined by a national board of the Federal Government, as the Federal Government provides considerably more than half of the funds with which the College extension activities are conducted. It seemed impracticable and inadvisable for the College to modify its

extension program. The College authorities, however, appreciate fully the importance of this question and in the interest of economy and efficiency they were in sympathy with the committee's investigation and regret that the Legislature did not take steps to eliminate needless duplication in these activities. It is still believed that it is unwise for the State to attempt to carry on its agricultural extension work by two independent agencies where the work is largely a matter of duplication of effort.

THE LEGISLATIVE INVESTIGATING COMMITTEE.

The Third Called Session of the Thirty-fifth Legislature provided for a joint committee from the House and Senate to make a thorough investigation of the different departments and institutions of the State government. A subcommittee, consisting of Honorable Leonard Tillotson, Senator I. B. Clark and Dr. Oscar Davis, was appointed to investigate the University of Texas, the Agricultural and Mechanical College of Texas and its branches. The committee spent several days at the College during the month of December. The report of this committee is one of the most important contributions that has been made to the cause of education in this State. That part of the subcommittee's report relating to the Agricultural and Mechanical College is reproduced in this report for the information of the public. Attention is especially directed to that part of the committee's report relating to the per capita cost of instruction at this College, the statistics relating to attendance, the average number of hours given to actual teaching by the instructional staff, and the average salary for the teaching staff. One paragraph in this report is repeated here for emphasis:

"It is doubtless true that a large part of the citizenship of the State has but small appreciation of the equipment Texas has established at College Station for the education of its young men in the agricultural sciences and the mechanical arts. The inventoried value of the plant on August 31, 1917, was \$2,727,492.38. During the fiscal year 1916-17, the State appropriated for the College \$805,066.50, but at the end of the year had increased the investment of the State thereby \$524,667.50, leaving as the net cost of the State for the year, \$280,399.00. To this sum was added appropriations by the Federal Government, from the Morrill fund and the Smith-Lever Act, amounting to \$124,250.73, making the net cost to the State and National Governments for the year, \$404,694.73."

I take this occasion to also call attention to the recommendations that the committee has made with reference to extending the usefulness of the College. If these recommendations can be carried out it is certain that the College would enter upon an unusual era of success and prosperity.

SURVEY OF TEACHING STANDARDS.

On January 8, 1918, I recommended to the faculty that a committee "to make a survey of the teaching standards in the college and that emphasis be given to the following points:

"1. The ability of the teachers of the college, (a) to conduct classes skillfully in theory and practice; (b) to get the most out of the time

consumed in the class recitation or laboratory; (c) to maintain interest and attention.

"2. A study of the use of textbooks with reference to, (a) adaptability for particular class purposes; (b) proper use of textbooks in the class room; (c) insistence on proper preparation of textbook assignments; (d) use and abuse of lecture notes and laboratory manuals."

The faculty heartily approved this recommendation and I appointed Dean Charles Puryear, Chairman, Dean J. C. Nagle and Dean E. J. Kyle the committee to make this survey. In my announcement to the heads of the departments of the personnel of this committee the following statement was made:

"This committee will make the survey as a unit. In other words, the entire committee will investigate all departments of the college irrespective of their particular school. I have requested the committee to confer with the heads of departments with reference to details and I will thank you to co-operate as fully as possible with the committee in this undertaking."

The committee began its work in the early spring of 1918 and completed its work about the close of the regular session. I have before me the report of the committee.

In commenting on the method pursued the report says:

"The committee, by means of unannounced visits, observed the class work of each instructor in the college, making one hundred visits to classes in theory and sixty-five visits to classes in practice."

The report clearly indicates that the work of the committee was thoroughly and conscientiously performed. Some criticisms were made on the teaching in some of the departments. But the following paragraph from the report will indicate the general conditions found by the committee:

"We desire to say at the outset that we were on the whole favorably impressed with the character of the work being done by the members of the teaching staff of the college. As a general statement they are well up in their subjects, alive to the importance of thorough preparation and have their work well in hand."

I am thoroughly convinced that this survey has resulted in great good to the college and the standards of teaching will be raised as a result of the survey that has been made. It is contemplated that surveys of other activities of the college will be made from time to time as a means of increasing the efficiency of the entire work of the institution.

THE SMITH-HUGHES ACT.

On July 1, 1917, funds became available under the provisions of the Smith-Hughes Act. This act provides funds for the salaries of teachers of agriculture, the trades and industries and home economics and for the maintenance of teacher-training departments, and for research work. The funds for salaries for teachers of vocational agriculture in the high schools are apportioned on the basis of the ratio of the rural population of the State to the total rural population of the United States. Due to the relatively large rural population, Texas will receive the largest sum of any State in the Union, with the exception of Pennsylvania. The funds for salaries of teachers of trades, indus-

tries and home economics in the high school are apportioned on the basis of the ratio of the urban population of the State to the total urban population of the United States. Since the urban population of Texas is relatively small, the State will receive proportionately a small amount from the Federal Government for these purposes. Texas is thirteenth in rank with a ratio of 2.20. The funds for the training of teachers of agriculture, home economics, trades and industries are apportioned on the basis of the ratio of the total population of the State to the total population of the United States. Texas stands fifth in rank with a ratio of 4.24. The following figures show the funds available for Texas:

Year.	Agricultural Teachers.	Trades, Industries, Etc.	Teacher Training.	Total.
1917-18.....	\$ 29,950	\$ 11,000	\$ 21,200	\$ 62,150
1918-19.....	44,925	16,500	29,680	91,105
1919-20.....	59,900	22,000	38,160	120,060
1920-21.....	74,875	27,500	42,400	144,775
1921-22.....	89,850	33,000	42,400	165,250
1922-23.....	104,825	38,500	42,400	185,725
1923-24.....	119,800	44,000	42,400	206,200
1924-25.....	149,750	55,000	42,400	247,150
1925-26.....	179,700	66,000	42,400	288,100

The Board of Directors, on January 28, 1918, by formal resolution, authorized the President of the College to accept the benefits, and as far as practicable, to meet the requirements of the Smith-Hughes Act. As a result of this action the College has been designated as the institution in Texas to train teachers of vocational agriculture and the trades and industries. The faculty, on February 26, 1918, adopted, and has since announced, a four-year course of study in Agricultural Education and in the trades and industries in conformity with the requirements of the Federal Board for Vocational Education. The College has entered seriously upon the task of training teachers of agriculture and the trades and industries, and there is every indication that this will prove to be one of the most acceptable phases of the College work. In another connection I am making a recommendation that will give this work a larger place and more definite recognition if it meets the approval of the Board.

II.

Attention is invited to several important matters that relate to internal efficiency.

ORGANIZATION OF THE COLLEGE.

The growth of the College has made it necessary to delegate larger responsibilities to standing committees of the faculty. At the present time many matters that were formerly considered at faculty meetings are now disposed of by the Administrative Council, which is a faculty organization composed of the President of the College and the deans of the different schools. This plan of organization has reduced the number of general faculty meetings to two each month and the minor faculties meet only once each term. This plan has conserved the time of busy

men for essential tasks connected directly with their work and places upon a small administrative group the responsibilities for routine matters.

COST OF INSTRUCTION PER CAPITA.

From time to time the question of the cost per capita of instruction at our educational institutions is raised and in most cases the information given out is very erroneous. The fact is, that it is very difficult to determine with any degree of accuracy the per capita student cost of instruction. In most cases many items are included in the aggregate sum used as a dividend in the calculation that are not used for the purpose of instruction. In other words, to attempt to determine the per capita cost of instruction in this College by dividing the totals at the end of an appropriation act by the total number of resident students will give a quotient far in excess of the actual cost of instruction, for these totals would include building items, items for repairs, which should not be made a charge against any particular year. Buildings and other permanent improvements are designated to serve the needs of students through many consecutive years and only that proportional part of the cost of these expenses should be used after the duration of these improvements has been determined. In this College it has been customary to include the extension service appropriation in the general College budget. No part of this sum enters into the cost of intermural teaching. This item, obviously, should not be included in estimates of this kind. If this is to be regarded as an important matter, some policy should be adopted and some principle should be determined upon for estimating per capita cost of instruction accurately. But for the information of the public, without regard to the questions herein discussed, I submit figures showing the per capita cost of instruction for this College through many years:

APPROPRIATIONS MADE BY THE LEGISLATURE OF THE STATE OF TEXAS TO
THE AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS FROM
1876 TO 1917, INCLUSIVE, TOGETHER WITH A STATEMENT OF
THE COST TO THE STATE PER LONG SESSION STUDENT.

Year.	Students.	Appropriations.		Cost per Student.	
		M. and S.	B. E. and I.	M. and S.	All Appro.
1876 to 1888	2,248	\$ 100,000 00	\$ 171,300 78	\$ 44 48	\$ 120 68
1889	207	15,000 00	41,500 00	72 46	272 95
1890	279	20,000 00	7,900 00	71 68	100 00
1891	318	20,000 00		62 89	62 89
1892	331	20,000 00	46,100 00	60 42	199 70
1893	293	20,000 00	5,117 91	68 26	85 73
1894	313	25,000 00	25,000 00	79 87	159 74
1895	372	30,000 00		80 65	80 65
1896	354	30,500 00		86 16	86 16
1897	297	30,500 00		102 69	102 69
1898	339	27,500 00	33,000 00	81 12	178 47
1899	356	27,500 00		77 24	77 24
1900	396	28,400 00	75,500 00	71 72	262 37
1901	382	41,650 00	32,000 00	109 03	184 95
1902	427	35,700 00	50,600 00	76 45	184 79
1903	396	35,700 00	1,850 00	90 15	94 82
1904	378	71,000 00	68,000 00	187 83	367 72
1905	414	71,000 00		171 50	171 50
1906	411	73,085 00	21,400 00	177 82	229 89
1907	515	73,085 00	15,000 00	141 91	171 04
1908	623	79,085 00	98,200 00	126 94	284 57
1909	639	79,085 00	90,000 00	123 76	264 61
1910	834	91,650 00	21,100 00	109 90	135 19
1911	1,082	86,650 00	10,100 00	80 08	89 42
1912	1,129	153,100 00	215,250 00	135 61	326 26
1913	1,015	162,600 00	333,500 00	160 19	488 77
1914	888	199,800 00	7,500 00	225 00	233 45
1915	915	288,050 00	12,500 00	314 81	328 47
1916	1,068	285,730 00	147,500 00	267 54	405 65
1917	1,242	303,505 00	406,150 00	244 37	563 33
Totals.....	18,501	\$ 2,524,875 00	\$ 1,936,068 69	\$ 135 93	\$ 241 12

RECAPITULATION.

Total enrollment, 1876 to 1917, 18,501.

Appropriations for maintenance and support, \$2,524,875.00.

Appropriations for buildings, equipment and improvement, \$1,936,068.69.

Total of all appropriations, 1876 to 1917, \$4,460,943.69.

Average cost per long session student, not including buildings, equipment and improvement, \$135.93 per year.

Average cost per long session student, including every cent appropriated for all purposes, \$241.12 per year.

I believe that the comparison of these figures with that of institutions doing similar work will show that the maintenance of this College is relatively low.

MILITARY ACTIVITIES OF THE COLLEGE.

Your attention is invited to the report of Professor F. C. Bolton, Director of War Educational Activities, that has been made a part of the biennial report of the College. On March 21, 1917, when it became clearly evident that war would be declared with Germany, the faculty of the College adopted the following resolutions:

"WHEREAS, The President and the Congress of the United States are confronted with a serious international crisis that may at any time result in a declaration of war; and

"WHEREAS, The Agricultural and Mechanical College of Texas is a land grant institution established by an Act of Congress in 1862, presumably for the purpose of preparing men for military service and technical pursuits; and

"WHEREAS, The conditions of modern warfare demand technically trained men for military service; therefore, be it

"RESOLVED, That we, the Faculty of the Agricultural and Mechanical College of Texas, earnestly request the immediate approval by the Board of Directors, sanctioned, if necessary, by the Legislature of the State, for the tender to the Federal Government of all research and instructional facilities at this College, the same to be subject to the direction of the Secretaries of War and the Navy, and that we hereby, individually and collectively, pledge our support to the international policies of the Federal Government and earnestly request the Governor and the Legislature of this State to assure undiminished the continuity of appropriations during the continuance of such Federal use, irrespective of the suspension of instructional functions of any or all of the College departments. We urge the favorable consideration of this resolution by the Board of Directors of the College, and, if necessary, by the Legislature also."

At a meeting of the board in Austin on March 23, the action of the faculty was unanimously endorsed. It is gratifying to recall that this institution was the first college in the United States to offer its facilities and equipment to the United States Government for military purposes. Immediately after the declaration of war practically the entire senior class of the College was excused from further collegiate duties in order to give these young men an opportunity to enter the first officers' training school located at Camp Funston, Leon Springs, Texas. In the early part of June commencement exercises were held in the Y. M. C. A. building at this camp and Honorable L. J. Hart, vice president of the Board of Directors, presented diplomas to the members of the senior class. This was probably the first incident of the kind in the United States, and other colleges of the country later followed our example in this matter. Since that date more than two thousand five hundred men who have pursued courses of instruction in this College, have enlisted in the military service of the United States. The records show that a larger percentage of these men held commissions than that from any other large college in the country. The College takes pride in the record that her sons have made on the battlefield. More than forty have given their lives for the great cause for which we entered the war, and others have suffered serious wounds or capture by the enemy.

More than 49 per cent of the men who have been graduated from the College since it was established entered the military or naval service. Out of the total of 1472 graduates 702 were enrolled in the army or navy. Six hundred and sixty-eight of this number were commissioned officers; 565 under-graduates were commissioned officers, making a total of 1233 officers who received their military education at this institution.

This number includes 2 brigadier generals, 7 colonels, 12 lieutenant

colonels, 52 majors, 173 captains, 456 first lieutenants, and 530 second lieutenants. Five hundred and eighty-four of these men were attached to infantry regiments; 198 were artillery officers; and 195 were with the engineers. The air service drew 116 while the remainder of those listed were with the marine corps, signal corps and staff corps. A number of these men have been decorated for bravery and several have received promotions on the field of battle for heroism and unusual discretion under trying and dangerous conditions.

The records are not available to show the number of men from the College who were engaged in various kinds of technical and scientific work for the government outside of the military service. However, the information available indicates that the number was quite large.

In this connection it seems appropriate to recommend that the Board of Directors consider the advisability of encouraging the erection of a suitable building on this campus in memory of the brave men who paid the supreme sacrifice in the greatest war of history. This building should contain photographs, relics and complete service records of every man in the service who was ever connected with the College. Such a memorial would be a fitting recognition of the service of these young men and at the same time serve to inspire the student body through all subsequent years.

III.

NEEDS OF THE COLLEGE.

The preparation of the budget presents one of the most serious responsibilities that confronts the governing authorities of a State educational institution. Honesty demands that every department of the College should be operated as economically as possible consistent with efficiency and thoroughness of work. But in no sphere of social endeavor is wastefulness more apparent than in an institution of learning where the departments are poorly financed, for the inevitable result is inadequate equipment and inefficient instruction. As paradoxical as it may seem, short-sighted economy is the grossest form of waste when practiced in an educational institution.

It is frankly to be admitted that it is difficult to determine with accuracy the financial needs of the various departments of the College with the variety of activities of that of the Agricultural and Mechanical College. It is impossible to apply the principle of manufacturing and commercial products; an educational institution cannot determine the quality of its products with certainty because the material that it receives from the homes and public schools presents innumerable differences in disposition, preparation, aptitude and application.

But all thoughtful men will agree that education in Texas, as well as elsewhere, has more than justified its cost, both in financial returns and social endeavor. A study of the productive achievements and the civic ideals of the thousands of students who have gone out from the Agricultural and Mechanical College more than justifies the financial outlay that has been invested in the College. The crises resulting from the war have magnified the importance of a college education. The contribution that college men have made to the successful issues of this war will justify forever liberal support for the maintenance and develop-

ment of our State institutions. This College points with pride to the achievements of its own graduates as an illustration of what has been done.

But a technical institution like the Agricultural and Mechanical College is called upon to perform services that yield more tangible results. Through the Extension Service and Experiment Station system the College is contributing directly to increased production in agriculture and animal industry. This is a measurable product that is worthy of study by those interested in the possibilities of educational endeavor.

SALARIES.

I earnestly request the board to carefully consider my recommendation with reference to salaries of officers, professors and employes of the College, which is being submitted in another connection. As you will observe, you are being requested to recommend to the Legislature and the Governor a reasonable increase under the present scale of salaries. The justification for this recommendation is so obvious as not to require an argument. The cost of living since the last budget was submitted to the Legislature has increased greatly. Wages in unskilled trades now exceed in many cases the amount being paid to professors in this College. You will see from the long list of resignations that the College has lost many of its most scholarly and useful men since I made my last biennial report. In almost every case these men resigned not because of any dissatisfaction with the institution, but because they were offered much better salaries elsewhere. In several instances men who have resigned have gone to other institutions at salaries ranging from fifteen to thirty per cent. more than they were receiving here. The College cannot hope to render its maximum service unless this condition is remedied.

The College authorities have been greatly handicapped in administering the salary fund appropriated by the Legislature due to the manner in which the budget was adopted by the Legislature. The Thirty-fifth Legislature undertook to fix the salaries of every employe of the College. This prerogative in the past has been assumed to be a function of the board and all previous Legislatures appropriated the salaries in a lump sum. The fact that the governing authorities have had no discretion in the readjustment of salaries has caused some dissatisfaction and prevented the board from making wise and appropriate readjustments that could not be foreseen two years in advance. It is earnestly hoped that the Legislature will make the salary appropriation in a lump sum, based, of course, upon an analysis of the salary schedule. The fact that an annual audit is made of the College books and a report of the accountants submitted to the Legislature gives ample protection to the State. The earnest consideration of the board is invited to this problem with the hope that the Legislature and the Governor may be induced to see the seriousness of the situation created by a minute itemization of salary appropriations.

A TEN-YEAR BUILDING PROGRAM.

Two years ago I submitted to the Board of Directors a ten-year program * This program was carefully worked out after a study of two years of the needs and the probable future policies of the College. This building program, as submitted two years ago, was as follows:

A TEN-YEAR BUILDING PROGRAM.

From the Thirty-fifth Legislature:

	1917-18.	1918-19.
Agricultural Building and equipment.....	\$325,000	\$ 25,000
Dormitories and equipment (one each year).....	90,000	90,000
Cottages	16,000	16,000
Mechanical Engineering Building and shops.....	20,000	75,000
Physics Building, including equipment.....		60,000
To remodel old chapel for library purposes and to provide library equipment for the same.....	6,150	5,000
Extension of sewer system, water mains and tunnels	10,000	5,000
Central gas plant, including pipe and fittings.....	15,000	.....
Poultry Husbandry Buildings.....	5,000	5,000

From the Thirty-sixth Legislature:

	1919-20.	1920-21.
Gymnasium and armory.....	\$200,000	.....
Library		\$150,000
Completion of dining hall.....	60,000	.....
Agricultural Engineering Building.....		75,000
Dormitories	90,000	90,000

From the Thirty-seventh Legislature:

	1921-22.	1922-23.
Extension Building	\$ 75,000	.....
Chemical Building		\$100,000
Dairy Building	75,000	.....
Dormitories	90,000	90,000
Machine shops	20,000	.....
Wood shops		15,000
Foundry		15,000

From the Thirty-eighth Legislature:

	1923-24.	1924-25.
Biology Building	\$ 75,000	.....
Electrical Engineering Testing Laboratory.....		75,000
Architectural Engineering Building.....	75,000	.....
Dormitories	90,000	90,000

*See Twentieth Biennial Report, page 20.

From the Thirty-ninth Legislature:

	1925-26.	1926-27.
Railway Mechanical Engineering Building.....	\$ 75,000	.....
Ceramics Building		\$ 50,000
Hydraulic Laboratory	45,000	.....
Dormitories	90,000	90,000

Due to war conditions that came on while the appropriation bill was pending the Thirty-fifth Legislature did not provide funds for all the buildings included in the program for 1917-1919. The Agricultural Building and one dormitory were not allowed. The failure to secure these buildings makes it necessary to readjust the building program. Changed conditions resulting from the war also make it necessary to make a slight revision in the program as outlined above. I submit, therefore, for your consideration the following, which in my judgment deserves the serious consideration of the Legislature.

REVISED BUILDING PROGRAM.

From the Thirty-sixth Legislature:

	1919-20.	1920-21.
Agricultural Building and equipment.....	\$250,000	\$ 25,000
Library, including equipment.....		150,000
Administrative Building for Extension Service....	75,000	.....
Cottages	10,000	10,000
Central gas plant, including pipe and fixtures....	15,000	.....
Greenhouse		10,000

From the Thirty-seventh Legislature:

	1921-22.	1922-23.
Gymnasium and Armory.....	\$200,000	.....
Dormitories	100,000	\$100,000
Completion of the dining hall.....	75,000	75,000
Agricultural Engineering Building.....	75,000	75,000
Vocational Educational Building.....	100,000	.....

From the Thirty-eighth Legislature:

	1923-24.	1924-25.
Dairy Husbandry Building.....	\$ 75,000	.....
Chemistry and Chemical Engineering Building....		\$100,000
Dormitories	100,000	100,000
Machine shops	20,000	.....
Wood shops		15,000
Foundry		15,000

From the Thirty-ninth Legislature:

	1925-26.	1926-27.
Biology Building	\$ 75,000	.....
Electrical Engineering Testing Laboratory.....		75,000
Architectural Engineering Building.....	75,000	.....
Dormitory		100,000

From the Fortieth Legislature:

	1927-28.	1928-29.
Railway Mechanical Engineering Building.....	\$ 75,000	.....
Ceramics Building .....	.....	\$ 50,000
Hydraulics Building	45,000	.....
Dormitories	100,000	100,000

A BUILDING POLICY.

There is implied in this building program the policy of the governing authorities of the College with reference to construction. It is believed that departmental buildings carefully designed with reference to the purposes they are expected to serve are wiser than to attempt the erection of larger buildings for housing several unrelated departments in which it is impossible to adapt them to the peculiar needs for which they are erected. A college building should function with reference to the specific use for which it is erected. It is the endeavor here to give distinctiveness to the buildings and to avoid giving them the appearance of large factory or manufacturing plant. This policy in no way interferes with a consistent style of architecture. If this policy can be adhered to in the future, two important ends will be accomplished: (1) The buildings erected will serve practically the ends for which they were designed, and thereby the efficiency of the College work will be increased. And (2) a uniform style of architecture will give a pleasing effect and fit into the campus plan that has been carefully designed for future development of the campus.

SCHOOL OF VOCATIONAL TEACHING.

In another connection I directed your attention to the provisions of the Smith-Hughes Act and indicated what funds would be available to Texas for the training of teachers of agriculture and the trades and industries. Attention was also called to the work that has already been undertaken by the College in carrying out the purpose of this act. The progress of the work thus far seems to justify taking another step in promoting the ends of vocational teaching through the encouragement that has been received from the Federal government. I wish to recommend that the Board establish a School of Vocational Teaching co-ordinate with the Schools of Agriculture, Engineering and Veterinary Medicine. In recommending this action it is not to be understood that the College is to become a normal school. It is not contemplated that this institution will ever come in conflict with the work of the normal colleges that have been established in this State. But under the provisions of this act referred to, the Agricultural and Mechanical College is the only institution in the State at the present time that is sufficiently well equipped to undertake the work of teacher training in agriculture and the trades and industries. At the present time no other institution has undertaken to perform this task and it seems imperative that this College should perform its duty to the cause of industrial education by fulfilling this need. The Smith-Hughes law makes large provision for the training of these teachers by offering to the State \$38,900 for the year 1919-20 and \$42,000 for the year 1920-21 for the train-

ing of vocational teachers, with provision that the State duplicate the funds.

While it will be possible to use very much of the present equipment of the College in connection with the work of this new school, there are certain essential additional facilities that will be required. The Federal Board for Vocational Education requires facilities for practice teaching. It will also be necessary to provide additional land where students may have the opportunity of actual farm practice under as nearly normal farm life conditions as possible. To meet these requirements it will be necessary to purchase additional land and to provide necessary buildings for this work. Not less than one hundred acres adjoining the present campus should be considered in providing for this requirement. This land should lie contiguous to the present campus and it should be sufficiently near to enable students in the School of Vocational Teaching to attend classes without serious loss of time in going from the farm to the College campus. If these conditions can be met there is every reason to believe that this new enterprise will greatly extend the usefulness of the College and contribute substantially to the development of the State.

CONCLUSION.

In conclusion I wish to acknowledge my indebtedness to the Board of Directors, the Deans and other officers of the College and to the entire teaching staff for co-operation and valuable assistance rendered in their respective capacities during the period covered by this report. The members of the Board have been uniformly considerate and through wise counsel have made it possible for me to avoid many errors that would otherwise have been impossible. The Administrative Council, composed of the Deans of the College, has contributed greatly to the solution of the many complex problems of administration that are constantly coming up in connection with the work of the College. The increasing reputation of the College for efficient instruction and high standards of work is due to the heads of the departments and courses, who have worked unselfishly for the accomplishment of these ends.

I gladly acknowledge the contribution that all of these have made and are making to the work of this institution. The building of a great College is not the result of any one man's endeavors, but the united assistance and co-operation of many men working in their respective spheres for a single purpose. I would give full faith and credit to each and every man and woman connected with this institution who is co-operating in this laudable task. With the harmony that has existed between all of these and the fine spirit of co-operation that is everywhere in evidence, there is every reason to believe that the future of the College is most promising and that in the future years it is destined to render an increasing service to the State and nation.

Respectfully submitted,

W. B. BIZZELL,
President.

REPORT OF THE DEAN OF THE COLLEGE.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: As Dean of the College I have the honor to submit the following report for the biennium including the years ending August 31, 1917, and August 31, 1918.

ENROLLMENT.

The enrollment for these two years has been as follows:

Summary of Enrollment, Session 1916-1917

Class.	Agr.	Sci.	Arch.	AE.	ChE.	CE.	EE.	GE.	ME.	NE.	TE.	VM.	Total
Regular Courses													
Graduate.....	5					1							6
Senior.....	82		10		1	21	33		11		2		160
Junior.....	79		2	1	3	18	11		9		6		129
Sophomore.....	56	5	3	1	6	27	16		14	4	3		135
Freshman.....	137	15	8	4	18	31	61	2	27	10	3	9	325
Special.....	63	6	2		1	4	3	9	2	0	2		92
Two-year Courses						C	D	E	F	G	H	M	
Second Year.....						33	22	4	8	3	3		73
First Year.....						98	85	86	27	5	9	12	322
Total, Regular Session.....													1,242

Regular Session1242

Summer Session, 1916:

College 21

School of Cotton Classing..... 71

Normal 52

Rural Life School..... 19

163

Summer Short Course for Farmers, 1916..... 385

Winter Short Course in Butter Making, 1917..... 11

1801

Less Duplicates 34

Grand total, 1916-17.....1767

Summary Enrollment, Session 1917-1918

Class.	Agr.	Sci.	VM.	Arch.	AE.	ChE.	CE.	EE.	GE.	ME.	TE.	Total
Regular Courses												
Graduate.....	10	2										12
Senior.....	53			1	1	1	15	9		4	3	87
Junior.....	31	2		2	1	5	13	10		5	3	72
Sophomore.....	78	6	6	2		10	22	31		18	5	178
Freshman.....	180	19	7	8	5	23	76	102	5	41	5	471
Special.....	34	9	1	2			3		4	1		54
Two-Year Courses												
					C	D	E	F	G	H	M	
Second Year.....					29	17	9	6		4	3	68
First Year.....					129			46	8	7	20	210
Total, Regular Session.....												1,152

Regular Session1152

Summer Session, 1917:

College 58

School of Cotton Classing..... 75

Normal School 56

Rural Life School..... 17

Farmers' Short Course..... 926

1132

College Signal Corps Course..... 7

United States Signal Corps, Depot Company K.... 107

Signal Corps School for Radio Mechanics..... 573

A. and M. College Draft Detachment..... 370

3341

Less Duplicates 148

Grand total, 1917-18.....3193

Among the changes affecting the academic side of the College, the more important are the following:

Minor Faculties.

Under authority of the Board of Directors the Faculty in September, 1916, adopted resolution defining the duties and the membership of the faculties of the several schools, thus in a very satisfactory manner disposing of a question that had been under discussion for a considerable time.

Reserve Officers' Training Corps.

The Act of Congress of June 3, 1916, known as the National Defense Act provided for the establishment in land-grant colleges of units of the Reserve Officers' Training Corps, the object being to enable students of such colleges to qualify themselves to become reserve officers in the U. S. army. The opportunity presented under this act was promptly accepted by this College and the necessary changes in the several curricula were made.

Summer Session.

The administration of all the educational activities of the summer session were placed under the supervision of the Executive Committee of the Summer School, which now includes the following divisions:

The Rural Life School.

The Summer Normal.

The Summer School of Cotton Classing.

The Summer Short Course for Farmers.

The College.

In the last named division opportunity is offered to secure College credit for work done.

Graduate Study.

For the first time the regulations governing graduate study have been put upon a satisfactory basis. The regulations now in force are administered by a Committee on Graduate Study, and are in line with those of the leading colleges.

Changes Due to the War.

Upon the declaration of a state of war by the United States, the Faculty decided to increase the time devoted to military drill and to make the necessary adjustments in the course of study. In the spring of 1917 a considerable number of students joined the colors and were given credit for work satisfactorily completed at the time of departure. For the session of 1917-18 many members of the Senior Class were called to the colors and were thus unable to complete their courses. They were given Honor War Certificates in lieu of diplomas.

Courses of Study.

A new course of study, in Agricultural Education, extending through four years, and leading to a degree has been established, effective September, 1918. The Course in Science, and the two short courses, preparatory to the freshman class have been withdrawn.

Students' Army Training Corps.

Under date of May 8, 1918, the Secretary of War made preliminary announcement of a comprehensive plan for introducing military training into the colleges of the country with the view of developing as a great military asset the large body of young men in the colleges. This plan led to the establishment of the Students' Army Training Corps and profoundly affected this and other Colleges, but as the plan went into effect after August 31, 1918, the discussion of it belongs to the report for the next biennium.

Very respectfully submitted,

CHARLES PURYEAR,

Dean.

REPORT OF THE DEAN OF THE SCHOOL OF ENGINEERING.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: For the School of Engineering I submit the following report:

SCHOLASTIC ATTENDANCE.

During the session of 1916-1917 there were 390 students in the four classes of the regular four-year engineering courses, and 55 students in the two-year engineering courses, making a total of 445 students in the School of Engineering. For the session of 1917-1918 the attendance was 436 in the regular four-year courses and 71 in the two-year courses, making a total of 507 in the School of Engineering.

REDUCTION OF NUMBERS OF ENGINEERING COURSES.

For the last two scholastic years instruction work in the School of Engineering has been carried out in accordance with announcements made in the catalogues, except that for the session of 1917-1918 the courses in General and Military Engineering were withdrawn and for the session of 1918-1919 in the Civil Engineering course, Group 2, Highway Engineering, and Group 3, Municipal and Sanitary Engineering, were consolidated, thus reducing the number of Civil Engineering course groups to two, namely: General Civil Engineering and Highway and Municipal Engineering.

For the session of 1916-1917 seven short courses were offered in the School of Engineering, as follows:

A two-year course in engineering; a two-year course for electricians; a two-year course for power plant operators; a two-year course in Textile Engineering; a two-year course in Telephony; a winter course for Road Supervisors and County Surveyors; reading courses in Highway Engineering.

For the session of 1917-1918 the first of the above named short courses was withdrawn, but the remaining six were still offered.

The object sought to be attained by reducing the number of options offered has been to concentrate the students' efforts more on fundamental principles common to several branches of engineering, and at the same time economize the time of instructors. Moreover, the courses which have been eliminated did not develop sufficient numbers of students to justify their continuance. Thoroughness in essentials, rather than a smattering of details is the object sought in all courses.

DEPARTMENTAL ACTIVITIES.

The heads of the several engineering departments' reports to me have been condensed into the following statements:

Architecture and Architectural Engineering.

During the scholastic year 1916-1917 twenty-three students registered for the course in Architecture, six in Architectural Engineering, and two in special work.

During the session of 1917-1918 thirteen students registered for Architecture, six for Architectural Engineering, and two for special work.

At the close of last session the two members of the teaching force of the department accepted positions elsewhere and the appointment of a new professor was necessary. It was necessary to have a professor in charge in order that the department might be held together so as to insure its future effectiveness, and because it has charge of the design and supervision of construction of buildings for the College and the associated institutions which are under the control of the same Board of Directors. The professor in charge is also helping with the teaching work in the Department of Drawing, which has been heavily loaded with work by reason of the large Freshman class, the members of which are required to take drawing.

During the last biennium additions to the architectural library have been made and the department is now receiving most of the technical magazines of American publication having architectural interest. The architectural library is one of the principal work rooms of students of Architecture.

Chemistry and Chemical Engineering.

The number of students instructed in this department during the last two years has been double that for the preceding biennium. The head of the department has had to locate many new members of his teaching staff to replace those who went into the army or other branches of war service. This has been the case also with other departments, but not to so large an extent.

During the last year the building occupied by this department has been remodeled in large part, and the rooms vacated by the Veterinary Department have been converted into chemical laboratories and class rooms. The roof and the interior of the building were painted after repairs had been made. Laboratory desks and chairs were purchased and installed and as a result the facilities for teaching have been increased. The sum of \$10,000, appropriated by the Thirty-fifth Legislature, was expended on this work.

At the present time the department is heated by means of stoves, which entails a fire hazard which should be eliminated as soon as possible. The head of the department estimates that it will require about \$5000 to install a modern heating system.

There is now no ventilating system for carrying off fumes from the laboratory. It is estimated that about \$1000 is needed to install such a system.

A better gas supply than that heretofore available will be an imperative necessity within another year. The head of the department recommends that an emergency appropriation of \$50,000 be secured, if possible, with which to construct a central gas plant for the College which

would also supply many other departments which now have to generate gas for laboratory use by means of small machines which are expensive to operate. He believes that the sale of gas to departments and campus residents will provide sufficient funds to operate the plant and make it self-sustaining. Without attempting to pass upon the adequacy of the sum named I desire to endorse the suggestion.

The head of the department repeats his suggestion regarding the employment of an analytical chemist for the purpose of requiring that supplies purchased by the College shall come up to the specifications under which they have been bought. Reference to this is made in the report of the Director of the Texas Engineering Experiment Station, and the recommendation in full may be seen on pages 114 and 115 of the twentieth biennial report of the College.

Civil Engineering.

During the last biennium this department suffered a severe blow in the death of the professor in charge, the late Dean Spence, in June, 1917. On November 30, 1916, Associate Professor D. C. Miller resigned and E. O. Francisco, serving as acting assistant professor, carried on the work to the end of the session. Both he and Associate Professor B. K. Coghlan entered training camps during the summer of 1917 and both received commissions and have since been serving as officers in the army. My appointment to succeed Professor Spence as Professor of Civil Engineering, and Dean of Engineering, dates from September 1, 1917. Mr. E. E. McAdams was appointed associate professor of civil engineering and assigned to instruction work in hydraulics as his principal duty. Mr. L. J. Voorhies was appointed associate professor of highway engineering, and also assisted with other instruction work of the department. Both appointments dated from September 1, 1917. On August 31, 1918, Mr. Voorhies resigned to accept a position in active practice at more than double the salary we were able to offer him here, and no successor has been appointed in his stead because of the falling off in the membership of the upper classes and their entry into army service.

For several years the importance of highway engineering has been recognized by making it a division of the civil engineering department. At the beginning of the present session railway engineering, and also structural engineering, received the designation of divisions. Each division is headed by a full professor, and the professor in charge of the whole department is the professor of civil engineering.

During the biennium additional instruments and apparatus have been added to the equipment, of which the most important is a well equipped laboratory for the study of bituminous paving materials. This gives us what is believed to be the best equipped laboratory of the kind in the South or Southwest, and enables us to render to cities services similar to those heretofore rendered to country districts in connection with less highly developed roadways.

Electrical Engineering.

Owing to unrest among the students on account of the war, and the large number who left for officers' training camps, the scholastic work for the last session has been below the average. Regular classes were small but the departmental staff has been unusually busy because of the instruction they were giving to signal corps soldiers undergoing instruction here. The professor in charge has served also as Director of War Activities for the College.

During the second term of last session a course in radio communication was inaugurated for the junior and senior electrical engineers, and for such other senior engineers as cared to elect it. This course was given at the request of the chief signal officer, and the men who completed it satisfactorily were eligible for the radio officers' training camp. Some of them entered the service in this way.

Several changes in the departmental staff have taken place during the last biennium. In October, 1917, Professor J. H. Cannon resigned to accept a position in the University of Michigan. He was succeeded by Assistant Professor W. C. Smith, who in turn resigned to accept a position also in the University of Michigan. In the fall of 1917 Assistant Professor Robin Beach resigned and was succeeded by Mr. I. J. Sheperd, who has since been promoted to an associate professorship.

During the last two sessions it has been impossible to meet the demand for electrical engineering graduates and the same difficulty obtains with the two-year electricians. It is the plan of the department to render such assistance as may be possible to electrical engineering graduates who may find themselves without employment after their discharge from the army. Our electrical engineering graduates have given general satisfaction in the positions they have filled, and in the readjustment after the war it is hoped that the standing they have held among the electrical engineering interests of the State will be increased.

Mechanical Engineering.

During the past two years the department has developed materially in permanent improvements and equipment. The old, worn-out equipment of the forge shop has been replaced and the new equipment will be installed in a temporary wooden building provided from army training funds. Plans and specifications are about ready for a new building, provision for which was made by the Thirty-fifth Legislature. In it will be located offices, class rooms, design rooms and small laboratories, but it will not afford adequate space for shops and other laboratories. To take care of these properly, and to admit of experimental research work as a part of the Texas Engineering Experiment Station, a laboratory building and equipment should be provided.

The two-year vocational course for power plant operators has been discontinued because the small number of students electing it did not justify the instructional expense attached. That the course was a good one, however, is attested by the success of the men who completed it.

The departmental staff has given earnest co-operation throughout and during the session of 1917-1918 the scholastic work was very satisfactory, in spite of a material reduction in attendance owing to the war. The teaching force was cut down as much as possible for reasons of economy.

In addition to work with the regular classes the department has done much in the way of training mechanics for the War Department, and that without any considerable additional expense to the College.

Five separate and distinct full-time intensive training courses have been outlined and planned for groups of soldiers, and in addition several part-time courses were planned and given to groups of signal corps men.

Textile Engineering.

For the regular work of this department there is nothing unusual to report for the last biennium. In the cotton classing work the faculty has authorized a somewhat fuller course for students taking agricultural education than has been offered to other students in the subject.

The summer school of cotton classing has continued to do well. Its maximum attendance was reached during the summer of 1917 when the enrollment was seventy-six. There was a considerable falling off in 1918, due to the entrance of so many men into the army.

At the suggestion of the Extension Department its expert cotton men working in Texas will act next summer as instructors in the cotton classing work of this department, and with their assistance it is expected that our next summer's attendance will be larger than any heretofore.

It may be said in a general way that the cotton mills of the State have been very prosperous and very friendly to the school. The cotton manufacturing industry of Texas should be increased, and attendance of textile engineering students should be larger as a result.

EXPECTATIONS.

The value of engineering training in fitting men for leadership has been so well demonstrated by the part such men have taken in army and other war work that it is hoped and believed that engineering education will experience a lasting impetus, and hereafter the engineer will not be regarded as a necessary nuisance, as seems to have been the case with some organizations employing him in the past. Students of engineering should become effective, directive leaders of progress, giving largely of their energies and abilities, and receiving something more than the meager pittance so grudgingly meted out to them generally in the past for their services.

Respectfully submitted,

J. C. NAGLE,
Dean of Engineering.

REPORT OF THE DEAN OF THE SCHOOL OF AGRICULTURE.

September 1, 1918.

President W. B. Bizzell.

DEAR SIR: In compliance with your request of November 4th, I am handing you, herewith, a report, giving a brief survey of the work of the School of Agriculture during the biennium ending August 31, 1919.

The report is made by departments, and is made up, largely, from the statements as handed in by the heads of departments.

DEPARTMENT OF AGRICULTURAL ENGINEERING.

The Department of Agricultural Engineering is now entering upon its fourth year of existence, having been separated from the Agronomy Department at the July, 1915, meeting of the Board of Directors. It has not had the opportunity, therefore, to become as well organized as some of the older departments. In the past year the courses in gas engines, farm machinery, tractors, concrete construction and farm building design have been standardized so that they will run parallel to those taught at other colleges where Agricultural Engineering Departments have existed for a long time. For each of the above courses a complete laboratory guide, representing several years of study and revision, has been written, and their use not only gives the prospective student a definite outline of the work offered, but it enables the department to maintain its courses of equal weight from year to year. Incorporated in the laboratory guides are the text-book assignments for the entire year. This eliminates the possibilities of a student not knowing what he is to study from day to day.

On February 15, 1917, two hundred and eighteen acres of wood land were transferred to this department from the Farm Department. This land has all been cleared of trees and is being in part farmed. A well has been dug and a house and barn have been erected in the past year. Steps are now being taken to terrace the land, to build a soil saving dam, and other structure which will make valuable observation projects for the farmer. The students will use this farm as a practice laboratory in studying power farming.

One of the largest undertakings of the department in the past year was that of the establishing a course in Auto Mechanics for the training of government men. On April 15th the first course was started with three hundred and twenty students and sixteen instructors. Since then the course has grown so that an additional temporary wooden building, 100'x240', had to be erected to house the laboratory. At present thirty-three civilian and thirty-eight drafted instructors are employed, and eight hundred students are being turned over to the government every eight weeks. The courses have been praised by the government inspectors for their excellent organization, their efficiency, and excellency of the students turned out. The department is justly proud of this accomplishment, especially when it is remembered that this work is being done

without expense to the State. Since we were pioneers in this work many other colleges turned to us for advice and information, and this alone has done much toward acquainting other states with the work of this College.

NEEDS OF THE DEPARTMENT.

The department, with its binders, gas engines, tractors, and other machinery, ought to have a fire-proof building adapted to its needs. The present building is such that we are ashamed to invite inspection, to say nothing of the crowded condition in which the instructional work must be carried on.

The fire hazard at present is so great that none of the companies will insure the building or its contents. This causes great anxiety, especially when it is remembered that the building contains \$50,000 worth of borrowed equipment. An inspection of the present Agricultural Engineering building, together with an understanding of what is being done by this department, is all that is necessary to convince anyone of the crying need of a new Agricultural Engineering building.

DEPARTMENT OF AGRONOMY.

IMPROVEMENTS.

During the session, 1917-18, the following new courses, for graduates only, were added to the work of the department:

	Th.	Pr.
501, 502—Advanced Farm Crops	3	4
505, 506—Advanced Soils	3	4
507, 508—Advanced Farm Management.....	2	4

In the spring of 1917 the department established and is now maintaining, for instructional purposes, a rather extensive farm crops garden. At the beginning of the session, 1917-18, the department secured the use of a modern greenhouse. Much new equipment has been secured for use in laboratory work. These additions to the teaching facilities of the department have made more efficient instruction possible, particularly in soils, crops, and plant breeding.

NEEDS OF THE DEPARTMENT.

The indoor soils and farm crops laboratories are inadequate for the work of the department. The soils laboratory is much too small. There is also a lack of storage room for soil laboratory equipment. The farm crops laboratory is temporarily located on the third floor of the Academic Building. It is not supplied with water or gas, both of which are essential in a modern crops laboratory.

DEPARTMENT OF BIOLOGY.

I submit herewith outline work of the Department of Biology for the biennium ending August 31, 1918.

During the second of these years a new instructor was added to the department, bringing the total up to seven.

The greater part of the work consisted of teaching; the average number of hours for each instructor being eighteen.

The original papers embodying the results of research were published in scientific periodicals by members of the department. Certain other original work is still under way and will be reported when completed.

During the second year of the biennium many changes occurred in the personnel of the department. Some instructors were attracted elsewhere on account of having been offered larger salaries; others left in order to engage directly in war work. In all, five men resigned from the department during the second year.

DEPARTMENT OF DAIRY HUSBANDRY.

COURSE OF STUDY.

Several changes have been made in the course of study offered by the Dairy Husbandry Department during the biennium ending August, 1918. The Dairy Husbandry courses offered in the two-year agricultural course were changed so that both the course in elementary dairying and the course in farm dairying are offered in the first and second term of the first year. Previously the elementary course has been offered in the first year and the farm dairying course in the second year. The change has the advantage of reaching more students with the farm dairying course, a course which has a valuable practical application.

The elementary course offered in the freshman class has, effective with this year's freshman class, been moved to the sophomore year. This change was made to meet adjustments in the freshman courses, and was not objected to by this department as the students will be in a better condition to grasp the dairy work after they have had freshman chemistry and physics.

The academic work of this department has, of course, suffered during the past two years as a result of war conditions; the advanced classes have been smaller, and there has been much disorganization and a general lack of interest. In spite of war conditions, however, we began 1917-18 with eight seniors. Four of these men completed their course, and the other four dropped out at various times to attend officers training camps.

We have not yet had an opportunity to graduate any men under the revised course of study which was effective with the 1916 freshman class.

CHANGES IN PHYSICAL PLANT.

Certain changes have been made in the physical equipment of the plant co-ordinate with this department. In the creamery we have lately installed a modern horizontal brine ice cream freezer, a refrigerating plant capable of furnishing refrigeration for freezing ice cream and pasteurizing milk, and a complete modern unit for making and emulsifying ice cream mix. These changes were necessary to take care of the increased demands for ice cream, due to the increased number of students.

THE DAIRY HERD.

On the 1st of October, 1916, the dairy herd was moved into the new dairy barn. This barn is modernly equipped with the latest type of barn equipment. In building and equipping this barn the two main ideas in view were those of sanitation and convenience; these are afforded in the highest degree.

At present the College herd includes forty-five head of registered Jerseys, thirty-eight head of grade Jerseys, thirty head of registered Holsteins, thirty-four head of grade Holsteins, nine head of Guernseys, and eleven head of registered Ayrshires. The original herd of Ayrshires, consisting of six females and the bull, were purchased in October, 1916.

In spite of the fact that conditions during the past two years were highly unfavorable to high milk production, the College herd has held its own, when compared with other years. The average individual yearly production for the past two years was 6135.9 pounds of milk and 239.5 pounds of butter fat.

The general quality of the herd has improved; this is particularly noticeable in the young stock. Two young bulls, a Jersey and a Holstein, were added to the herd during the time covered by this report. These bulls were selected largely on the records of production of their families and immediate ancestry, and they should prove to be quite a factor in the future improvement of the herd.

Two hundred acres of land were cultivated by this department during the last two years. In 1917 the crop was practically a failure. This year, however, the dairy farm produced six hundred tons of silage and sixty tons of oat hay.

RECOMMENDATIONS.

I wish to direct your attention to the immediate need of the dairy building. Our present laboratory and creamery are inadequate for taking care of the students and the commercial work of the department. At present no lecture room is available for this department, and we are forced to make use of any vacant rooms obtainable. As a result our work is distributed among several buildings; this results in confusion and inefficiency.

I wish further to direct your attention to the fact that no fund has ever been furnished this department for the purchase of live stock. What improvement has been made in this regard has been due to breeding and selection. While such improvement is practical, the time required is entirely too long.

DEPARTMENT OF ENTOMOLOGY.

The Department of Entomology, in the past two years, has instituted four additional courses.

The first of these known as Veterinary Entomology was arranged especially for the men in Veterinary Medicine. In this course laboratory and instructional work is given on the insects which are the transmitters of disease and those which are pests of domestic animals.

A course for two-year students in Apiculture has also been given for the first time. Texas ranks first in the production of honey and wax.

There are still great opportunities in beekeeping which ought to be developed, and this College ought to be the leader in this development.

Two courses in Advanced Entomology, Advanced Systematic and Advanced Economic Entomology were given for the first time last year. The students who pursued these courses have rendered very valuable service in the pink boll worm quarantine work. One of them, Mr. Ivan Schiller, discovered the first pink boll worm in this country.

The insect collection belonging to the department has been increased considerably by the purchase of a valuable collection from Dr. S. W. Blatchley, one of the best authorities in the country. The preparing and mounting of this collection was done by the Assistant Professor of Entomology.

The department has also rendered such service and support to the eradication of the pink boll worm in this State as was possible. A considerable number of students who were familiar with Southern conditions, consequently better qualified to do this work, were employed by the government and rendered inestimable service to the State, which no doubt meant the saving of an immense sum of money in the future.

At the suggestion of the Secretary of Agriculture of the United States, a survey was made of the cotton interests of the Rio Grande Valley. The information gained was presented to the Appropriation Committee of the House of Representatives in order to make clear the pressing need for funds to carry on the quarantine work against the pink boll worm.

DEPARTMENT OF HORTICULTURE.

NEW COURSES.

During the biennium ending August 31, 1919, the department has added the following courses:

Undergraduate Courses.

	Th.	Pr.
411. Marketing	3	0
412. By-Products	1	4
417. Civic Improvements	2	0

Graduate Courses.

501, 502. Advanced Fruit Growing.....	3	4
503, 504. Advanced Vegetable Gardening.....	3	4
505, 506. Advanced Landscape Art.....	2	4

IMPROVEMENTS.

The completion of the \$10,000 greenhouse in the fall of 1917 has enabled the department to greatly increase the efficiency of the class work, especially in Vegetable Gardening, Plant Propagation, and Plant Breeding.

During this biennium considerable progress has been made in the development of the grounds west of the railroad, including a commer-

cial peach orchard, a variety rose garden, and a representative collection of ornamentals. These plantings were made in 1917.

During the summer of 1918 the department offered two courses in the Summer School, and during the Short Course offered special work in Horticulture and Food Conservation. This work was very favorably received.

The department, through F. W. Hensel, has completed detailed plans for the laying out of the grounds for the Grubbs' Vocational School at Arlington and the John Tarleton College at Stephenville, and those plans are now being used by these institutions as a guide in making improvements.

NEEDS OF THE DEPARTMENT.

Canner.

The department has long been in need of a canner, including the building and suitable machinery. This summer the Extension Service erected a canner on the Horticultural grounds. It is proposed to have the department take over this building and equipment and to add to it as much as possible.

Additional Land.

The department is very much in need of additional land for the growing of commercial orchards, and for the production of vegetables, for the purpose of supplying the Mess Hall with fresh and canned fruits and vegetables. These orchards and gardens can be used to great advantage in giving students practical work in fruit and vegetable growing.

Barn and Tool Shed.

For a number of years the department has been using the old Dairy Building for a barn and tool shed. This building is totally unfit for this purpose. It is so unsightly that it should be torn down as soon as possible. The department, therefore, should be given a suitable building to be used as a barn and tool shed. An appropriation of \$1500 should be made for this purpose.

DEPARTMENT OF POULTRY.

COURSES.

(a) In the first term of 1916-1917 course A. H. 201, one hour theory and two hours practice, for sophomores, and course A. H. 11, two hours practice, for juniors and seniors, were given.

In the second term, course A. H. 54, three hours theory and two hours practice, for second and two-year students, and course A. H. 11, two hours practice, for juniors and seniors, were given.

In the summer session course A. H. 68, four hours theory and two hours practice, for summer students, was given.

In the first term of 1917-1918 course A. H. 201, two hours theory and two hours practice, for sophomores, was given. Course A. H. 11,

two hours each of theory and practice for juniors and seniors was also given.

In the second term course A. H. 54, three hours theory and two hours practice, for second year and two-year students, and course A. H. 11, for juniors and seniors, were given.

During the summer session course A. H. 68, four hours theory and two hours practice and a special course for vocational agriculture students were given.

(b) During the next two years I would like to add a course in Poultry Marketing for the juniors and seniors, two hours each of theory and practice, and a course in Poultry Judging, one hour theory and two hours practice. I would also like to add a course in Poultry Management for farmers and poultrymen of the State to consist of theoretical and practical work for a period of six weeks during the months of November and December.

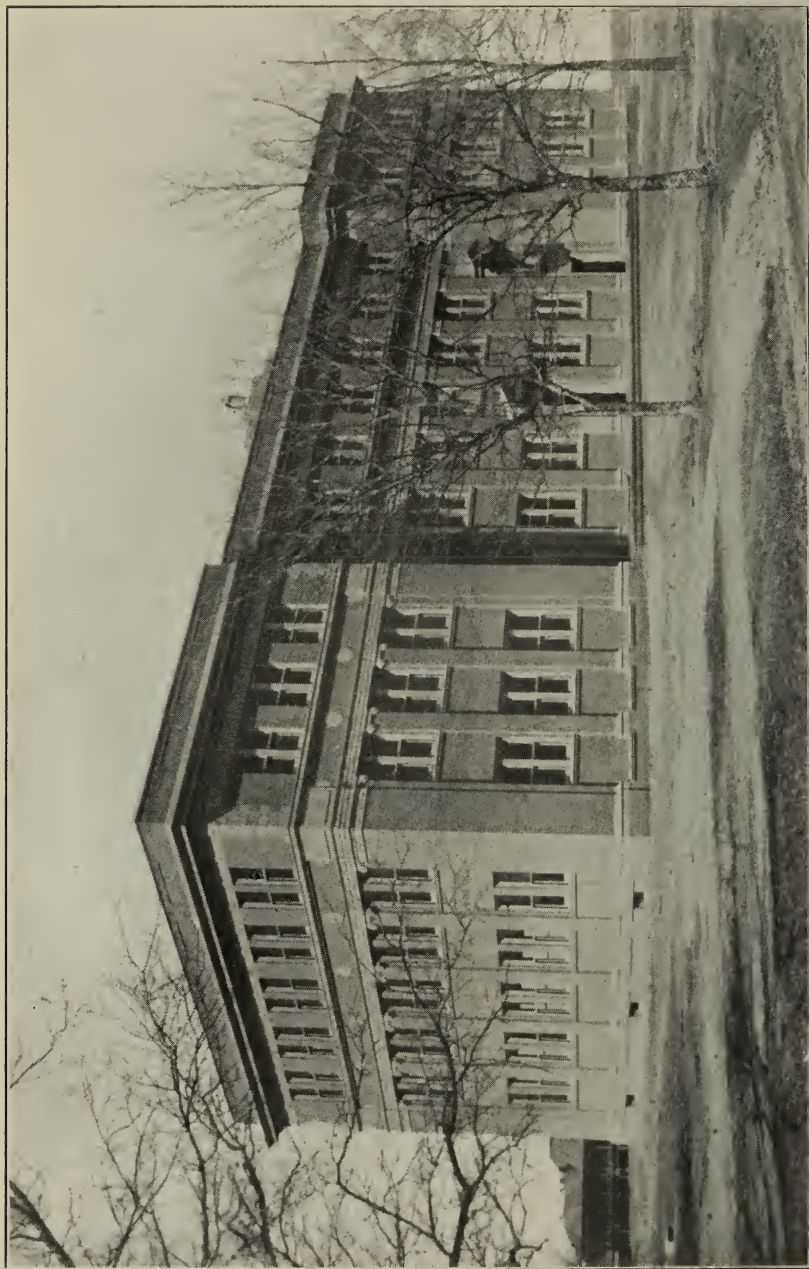
EQUIPMENT.

In the spring of 1916 forty acres of land was designated by the College for a poultry farm. In August, 1916, work was started to develop it into a complete instruction plant. The present equipment of the farm consists of one laying house, 20x30 feet, with concrete floor and foundation, four laying houses, each 14x14 feet, with concrete floors and double yards, eight laying houses, 10x10 feet, four brooder houses, each 8x10 feet, equipped, two brooder houses, 8x8 feet and 10x10 feet, A-shaped, one feed house and one incubator house, each 14x14 feet, and one pigeon house 12x12 feet with a fly 12x36 feet. These houses are all equipped with hoppers, fountain and necessary equipment. The farm has been fenced along the road with steel fencing and posts, which is the type of fencing that is being used throughout the entire plant. A half inch water system has been installed. There are seven varieties of poultry and three varieties of pigeons on the College farm.

It is hoped to enlarge and complete the farm as much as possible during the next two years.

Respectfully submitted,

E. J. KYLE,
Dean, School of Agriculture.



Francis Hall, the New Administration Building of the School of Veterinary Medicine.

REPORT OF THE DEAN OF THE SCHOOL OF VETERINARY
MEDICINE.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: I beg to submit the following report on the organization and work of the School of Veterinary Medicine for the biennium from August 31, 1916, to August 31, 1918.

The School of Veterinary Medicine consists, for the present, of the following departments:

Department of Anatomy.

Department of Physiology and Pharmacology.

Department of Pathology.

Department of Medicine and Surgery.

These will require division some time in the future when the classes become larger or as new subjects are introduced.

During the past year a new laboratory building has been erected on the Campus to supply suitable class rooms and laboratories. This has not been entirely finished and equipped yet, but we are using it, and can get along fairly well as long as our classes are small.

DEPARTMENT OF ANATOMY.

This embraces not only descriptive anatomy of the domestic animals but also histology, histogenesis and embryology. The department is fairly well equipped for the present but will require about \$2000 each year for office and janitor work and consumable supplies. About 170 students per year take work in this department. An instructor in anatomy will become necessary when College conditions become normal again.

DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY.

Regular college work was begun in these subjects September, 1916. A large amount of work, incident to the inauguration of new subjects, became necessary and consumed much time and attention. Special mention may be made of the collection and identification and preservation of a number of poisonous plants for class-room use and the frequent examination of foods and animal remedies suspected of having caused poisoning. The department is in need of more laboratory equipment, and a suitable place to grow medicinal plants.

DEPARTMENT OF PATHOLOGY.

The work of the pathologist has consisted mainly in the preparation of material for class and laboratory use. Much time and energy were spent on the plans and the equipment of the new laboratory. The class work done outside the department proper consisted in taking

charge of the regular sophomores and the short course work, which continued throughout the entire school year.

The department is now in fairly good condition. The most pressing needs are a small animal house for laboratory animals. No large amount of apparatus will be required during the war period.

VETERINARY MEDICINE AND SURGERY.

The following courses were offered to agricultural students:

Non-infectious Diseases.

Infectious Diseases.

Obstetrics.

Special lectures and clinics were also given two-year students.

Since September, 1918, the following courses have been offered to veterinary students:

Non-infectious Diseases.

General Surgery.

Clinics.

From September, 1917, to September, 1918, 1065 cases were treated in the veterinary clinic. Over 250 of these cases were animals from Farm Department, Dairy Husbandry Department, Animal Husbandry Department and Live Stock Departments of the Experiment Station.

When the Board of Directors decided to establish a School of Veterinary Medicine to train young men to safeguard the live stock interests against the ravages of disease, you asked for an appropriation of \$150,000. Only \$100,000 was appropriated. It was found impossible to provide modern clinical facilities in Francis Hall with the amount appropriated.

The Department of Medicine and Surgery needs a modern clinic building, as it is impossible to conduct classes and teach students in a satisfactory manner with the present facilities. The Board of Health also insists that a more modern building be provided to take the place of the old barns and shacks we are now using for sick animals. A clinic building should be provided with large, well lighted operating rooms, dark rooms for the examination of animals with eye diseases, sanitary stalls, pens and cages for sick animals, and quarters for ten students. It is important to require students to take hospital service for certain periods, and in order to do this students should be constantly in touch with the patients. At the present time such a building would cost about \$65,000.

The Texas Veterinary Medical Association has expressed a desire to hold its annual meetings at College Station. Such a building would provide ample facilities for the sessions and conferences of this association, which would be a great benefit to the State and to the veterinary students.

ANTI-HOG CHOLERA WORK.

DEAR SIR: I beg to submit the following report on the preparation of anti-hog cholera serum.

During the past year the serum laboratory has finally been completed

There was some delay on account of marked advance in material and scarcity of labor.

From September, 1917, to September, 1918, 116,476 doses of anti-hog cholera serum were prepared. In addition to this we bought 50,000 doses and borrowed 10,000 doses from the Bureau of Animal Industry.

Having produced all possible with facilities at hand, bought all the good serum we could at a reasonable price, and borrowed from the Federal government, we were still unable to supply the demand for thousands of doses.

Therefore, I wish to recommend that the serum laboratory be enlarged, which would cost about \$7500, and that a cold storage plant be installed, which would cost about \$2500, where a supply of serum could be stored to protect the swine industry against serious outbreaks of hog cholera.

I beg to submit the following suggestions:

1. That the attention of the Board of Directors be called to the desirability and necessity of providing a clinic building for our veterinary work. This will cost, say, \$65,000, and should be provided in the immediate future.

2. That a suitable piece of land be assigned permanently as a garden for medicinal plants. I think this could be done, in cooperation with the Bureau of Drug Plants of the United States Department of Agriculture, and be made of great educational value.

3. That the Department of Pathology be provided with an animal house for small animals. This must be well isolated for our Veterinary Hospital, and will not cost over \$500.

Respectfully submitted,

MARK FRANCIS,
Dean, School of Veterinary Medicine.

REPORT OF DIRECTOR OF EXPERIMENT STATIONS.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: In compliance with your request I have the honor to transmit herewith the biennial report of the Texas Agricultural Experiment Station for the years 1916-17 and 1917-18:

THE STATION'S PART IN WINNING THE WAR.

The biennium just closed covers practically the same period of time as this country's participation in the world war. When the country entered the war, the food stores of the allies were so low that the responsibility of feeding and clothing the fighting men, and the civilians as well, fell to the hands of the American farmers and stockmen. An immediate demand was made upon the experiment stations of the country for the kinds of information which might at once be put quickly into action on the farms and ranches.

Nothing could have been more fortunate for the country than the fact that thirty years previously an experiment station system had been provided for each state and territory. During this time, the experiment stations, through their laboratories and experiment farms, had been turning out a type of information which could be put into immediate service when the war began. During the past two years it has become axiomatic that the experiment stations and Federal research laboratories of the country constituted the only branch or branches of the public service which were at all prepared to begin the offensive the day that war was declared.

The Experiment Station should be properly manned and equipped for not merely a few of the more important agricultural problems of the State, but for the investigation of all the problems of importance affecting Texas agriculture. The Experiment Station, like a great piece of machinery, can only be operated with the highest degree of efficiency when all the essential parts are present and kept in perfect condition. While recent legislatures have been increasingly liberal in their support of Experiment Station work in Texas, there have been times when it was difficult to convince them of the necessity of providing all the essentials to successful station work. During the present biennium, the funds provided for the station would have been much more useful had the Appropriations Bill not been cut up into a vast number of separate appropriations. The inflexibility of the appropriations thus secured has made it impossible to handle all the affairs of the Station in the most thorough-going and business-like manner. Such a system works no more to the advantage of the State than it would if adopted in the business affairs of individuals or corporations.

The Experiment Station has not only been of service through its research work, but has also materially aided in winning the war by virtue of its activities in honestly and fearlessly enforcing the pure feed law

of the State. Had it not prevented the misbranding and adulteration of cotton seed products alone, the feeders of this State would have paid immense sums of money for cotton seed hulls at the price of cotton seed meal. This unnecessary charge would have been transmitted on and on until in the purchase of the finished animal products and by-products, the ultimate consumer, or society at large, would have footed the bill. It should be perfectly obvious that if the feeder should have had to stand the loss, there would not have been the impetus to animal production which was necessary in order to feed ourselves and our allies during the period of the war.

In order that a dollar's worth of cotton seed meal might actually be delivered for each dollar invested, the Feed Control Service took the pains to inspect and sample each and every car of cotton seed meal and cake that was ordered through the State Food Administrator, make analysis of the sample, and send copies of the analysis to the State Food Administrator, the manufacturer, and the buyer. In fairness to all concerned, adjustments were made on the basis of the analysis.

While we are not unmindful of the incomplete state of development of the Texas Station, it is a matter of pride to its staff—and should be the pride of the State—that this was one of the several stations which were not found wanting when the critical hour appeared. It may be interesting to note that the Agricultural Committee of the National Research Council, in its efforts to place every experiment station not already so, on a war basis, found few if any suggestions involving changes in the nature and scope of our investigation work. In fact, this station has been congratulated upon the fact that its work prior to the war was on a war basis. This condition was due to the fact that this station has ever had in view the importance of restricting its activities to the more important problems confronting the farmers and stockmen of the State. The war has presented opportunities to the station, not only in the matter of furnishing an outlet for the information which it has accumulated through investigation, but also because of the fact that it has caused farmers and stockmen to realize quite fully, for the first time, the necessity for such information as the experiment stations yield. Then, too, the intensity of this demand for agricultural information has brought the station staff into a more intimate relation with the farmers and stockmen than was at all possible prior to the war. Previously it was necessary for the station men to go out among the farmers and stockmen and study their problems, regardless of the fact that the farmers and stockmen themselves, in many instances, were not at all alarmed at the difficulties confronting them.

SOIL SURVEYS.

Realizing that soil surveys are prerequisite to the most advanced types of investigations pertaining to farm problems, this station has co-operated quite closely with the Federal Bureau of Soils for a number of years. The attention of the Thirty-fifth Legislature was called to the important relation of soil surveys to the development of Texas agriculture and, accordingly, an initial appropriation of \$7500 per annum was made for continuing soil surveys in Texas, in co-operation with the Bureau of Soils of the United States Department of Agriculture. Dur-

ing the latter half of the past biennium, a number of surveys have been made under the existing co-operation. Surveys of Bowie, Red River, Denton and Freestone counties have been completed, and surveys of Dallas, Tarrant and Erath counties have been begun.

Soil surveys are not only essential to accuracy in conclusions pertaining to the possibilities for agricultural development, but they are of immediate service to every farmer in the proper tillage and utilization of the soils on his farm. They will also be of intrinsic service in relation to the matter of land settlement. It is only a matter of time until the undeveloped sections of Texas will be settled, by one means or another. As in the past, this may be accomplished through private colonization schemes operated in a manner favorable to the general welfare. And it is proposed, of course, by Governor Hobby and Secretary Lane, that some method of public land settlement be adopted. These proposals have caused a rather close study to be made of tenure in relation to size of holdings throughout the world. There is some reason why France and some parts of Germany are areas of small land holdings, and England, notwithstanding the crowded condition there, is a country of large estates. Considering these conditions, together with the differences between American social and economic conditions and those prevailing in the European countries, it should be possible for the State of Texas to determine a system of land settlement that will work to the best interests of the State. Whenever a definite course of action is decided upon, a soil survey will prove to be the first demand, as has been the case in Wisconsin, California, and other sections in which the land has been settled either by public endowment or private colonization.

NEW BUILDING.

It is pleasing to note that the new Experiment Station building, proposed several years ago, because needed even then, is in fair way for early completion. This building, being equipped to meet the laboratory requirements of the several divisions, will undoubtedly prove to be the greatest impetus that agricultural research has ever had in Texas. By virtue of the superior work which may be conducted in the laboratories of this building, the character of the work of every division of the station should take first rank among that of the leading experiment stations of the country.

THE WORK BY DIVISIONS.

The following is a brief statement of the work under way in the various divisions of the Station during the past two years. Detailed results will be given in bulletins and circulars as from time to time the facts at hand warrant publication:

Veterinary Science.

"Infectious Anemia of Horses and Mules," Adams fund. This is a serious disease of horses and mules which has baffled investigators as to means of control. Since the disease causes heavy losses of work stock, its control is of very great importance to the State.

"Swell Head of Sheep and Goats," Adams fund. This is a very serious disease in the sheep and goat-raising sections of the State, and

its study was begun at the request of the sheep and goat raisers of the State.

"Loin Diseases in Cattle in the Coastal Plains of Texas," Hatch fund. This is an obscure, and highly fatal, disease of cattle, which has so far not yielded to investigation, but because of the seriousness of the disease, it is being studied further.

"Stomach Worms in Sheep and Goats," Hatch fund. Investigations are under way to determine the influence of the stomach worms on the health of the animal, and to develop practical means of control.

"Texas Fever," State funds. The well known work of the division in the inoculation of cattle against Texas Fever, or "tick fever," is being continued, with the usual success. This work has been greatly facilitated during the past year, by the provision for a model and adequate barn for the cattle being treated, as well as for the storage of feeding stuffs.

"Unknown Diseases of Sheep and Goats," State funds. In Western Texas there are a number of diseases of sheep and goats which are apparently unknown to animal pathologists. These diseases are being studied, with a view of determining their character and developing control measures.

"Abortion in Sheep and Goats," State funds. Considerable losses occur in Texas from abortion in sheep and goats, and these investigations are designed to determine the causes of this abortion, and to perfect means of control.

The work of the division has been greatly strengthened during the past year by the fact that the State Legislature allowed appropriations for a model barn for Texas Fever work; an anthrax serum laboratory, and for operating expenses and equipment, which were very much needed.

Chemistry.

"Soils Studies," Adams fund. Investigations of the fundamental properties of soils, particularly with reference to phosphoric acid, potash and humus of the soil and its nitrifying and other biological properties.

"Nutritive Values of Feeds," Adams fund. Study of (a) the productive values, (b) the proximate composition, (c) the digestibility of the proximate constituents of feeding stuffs.

"Fertilizer Studies," State funds. Composition, properties, and agricultural values of fertilizers, fertilizer materials and ingredients, and experiments relative to the value of fertilizers, including value of fertilizers on various types of soil, and their needs for fertilizers.

"Soils," Hatch fund. The composition and properties of various types of soil found within the State.

"Human Food," Hatch fund. The composition, properties, and utilization of plants and plant products as human food.

"Analyses of Feeding Stuffs for the Feed Control Service," Feed Control Service funds. The Chemist of the Experiment Station is chemist for the Feed Control Service, and does the official analytical work required in the enforcement of the pure feed law.

"Adulteration of Feeds," Feed Control Service funds. The composition and adulteration of feeding stuffs, including methods.

"Fertilizer Control, Administration, Inspection, Analyses, and Methods of Analysis," State funds. By law, the Chemist of the Experiment Station is also State Chemist, and as such is charged with the enforcement of the State law regulating the sale of commercial fertilizers and poisonous insecticides in the State.

"Miscellaneous Analyses of Waters, Soils, Minerals, and Miscellaneous Substances," State funds.

Horticulture.

"Plant Breeding, Using Blackberries and Dewberries, genus *Rubus*," Adams fund. Hybridization of blackberries, dewberries and raspberries, with the object of obtaining new and improved varieties for cultivation, and to study the laws that govern variation and hybridity in these plants.

"Longevity of the Indian Peach," Hatch fund. Studies of the longevity, adaptability, and other qualities, of the old-fashioned Indian Cling peach, as compared to the modern commercial varieties.

"Studies of Grapes," Hatch fund. Studies of the *Vitis vinifera* when grafted on to the roots of some of the more hardy native Texas grapes, with the view to developing, if possible, a more suitable variety for cultivation under Texas conditions.

"Tests of Introduced Fruits," Hatch fund. Under this study an orchard is maintained for the study of the adaptability of fruits introduced into the United States. Large numbers of newly introduced fruits and shrubs are secured each year from the Federal government, which are tested out in this orchard, and definite studies are made of each introduction.

"Field Experiments with Crown Gall," Hatch fund. A comprehensive study of this nursery disease, which has ruined thousands of trees each year in Texas for many years. The object is to find a means of control, or prevention, of the gall, and to determine whether or not there is a practical remedy for it.

"Arboretum of Forest Trees," Hatch fund. This arboretum is maintained for the purposes of finding the species of forest trees most suitable for shade, ornamental, and other purposes, and as windbreaks for live stock.

"Pecan Stock Investigations," State and local funds. This work is being done by the Professor of Horticulture in the College, under the terms of the co-operative agreement with the School of Agriculture. The object is (a) to determine the relative vigor and hardiness of pecan stock from the planting of the seed until the stock is large enough to be worked, and (b) to determine the effect of the stock upon representative varieties of pecans as to hardiness, ease of propagation, early bearing, productiveness; (c) to determine the effect of climate and soil upon pecan stock.

Animal Husbandry.

Feeding Investigations.

"Feeding Baby Beeves," State and local funds. With a view to determining as nearly as possible the best methods of fattening calves for market, or the production of baby beef, and making comparisons of

cold-pressed cotton seed and peanut meal for supplementing a ration composed of ground milo, corn or sorghum silage, and Sudan grass hay, for fattening cattle, and the comparative feeding values of Sudan grass hay and cotton seed hulls.

"Fattening Hogs," State and local funds. To compare a ration of straight milo chops with milo chops supplemented with cotton seed meal; the feeding value of milo chops and cotton seed meal when dry, wet, self-fermented; in self-feeder, and when used with copperas; to compare light and heavy feeding of cotton seed meal; cotton seed meal and meat meal as supplements to milo chops; ground milo with whole or unground milo; and to determine the efficiency of the protein in cotton seed meal in comparison with protein meat meal.

"Fattening Yearling Steers," State and local funds. The object of this experiment was to determine the relative values of cold-pressed cotton seed and ground whole pressed peanuts for supplementing the basal ration of milo chops, sorghum silage and Bermuda hay, for fattening. Forty-one high-grade Hereford yearling steers, divided into two lots, were used.

"Fattening Two-Year-Old Steers," State and local funds. The object of this experiment was to compare cotton seed meal and peanut meal (pure) for supplementing a basal ration of milo chops, sorghum silage, and Bermuda hay, for fattening steers. Thirty-four high-grade two-year-old Aberdeen-Angus steers were used.

Sheep and Goat Breeding Investigations.

"Sheep Feeding and Breeding," State funds. To determine (a) which of the most common breeds of sheep when crossed on to fine-wooled ewes will produce the most thrifty and desirable lambs when grown and fattened under Texas conditions; breeding pure-bred rams of Rambouillet, Southdown, Shropshire, Hampshire and Lincoln breeds, and a half-blood Karakule ram, to Rambouillet ewes; (b) to compare cotton seed meal with hulled peanut meal when fed to sheep as a fattening ration; (c) whether "broken-mouth" ewes can be profitably purchased from range flocks of Western Texas, removed to farm, and bred to ram of mutton breeds and the resulting lambs fattened and marketed within a year; (d) whether aged ewes dropping lambs in January and February can profitably be handled under farm conditions.

"De-tailing, or Docking, Lambs," State funds. To determine whether the de-tailing, or docking, of young lambs by means of the hot-searing pincers can be practiced with as effective and satisfactory results as by the use of the ordinary knife.

"Amount of Shrink as Result of Dipping Sheep," State funds. To determine whether the dipping of sheep in any of the recognized dips is deleterious to the sheep during the time immediately following the operation.

"Lamb Feeding, Sheared vs. Unsheared," State funds. To determine and compare the gains made by sheared and unsheared lambs when fed on identical fattening rations over a feeding period of 126 days.

In addition to the work outlined above, a great deal of development work for the sheep and goat experiments has been done at the sub-

station at Spur and at the Angora Goat and Sheep Substation, near Sonora.

Swine Investigations.

"Investigation of Pork Production," State and local funds. To determine (a) which forage crops are best adapted for pork production in Texas, (b) to compare grain-forage methods of making pork with the grain-dry lot method, (c) to determine the cost of growing a 50-pound pig with and without forage, (d) to determine the cost of keeping brood sows a year, both with and without forage.

"Swine Feeding Investigation," State and local funds. (I) To determine (a) the value of peanuts grazed for pork production, (b) the effect of whole peanuts on pork and lard when grazed by hogs, (c) the effects of different rations on the pork and lard after softening by peanuts, (d) whether or not a grain ration fed in connection with peanuts will prevent the flesh and lard from getting soft, (e) whether or not hogs can be hardened profitably with a grain ration after they have been made soft with peanuts, (f) to determine and study the melting points of the lard taken from the hogs of the various lots used in the test.

(II) To determine (a) the value of peanut meal both with and without the hull, when used as a supplement to milo chops in a ration fed to hogs, (b) to compare peanut meal with tankage and cotton seed meal as supplements to milo chops, (c) to compare a "narrow" peanut meal-milo ration with a "balanced" ration of peanut meal and milo, (d) to study the effect of peanut meal on the quality of the pork and lard.

"Special Investigation of Soft Pork," State, Hatch and local funds. To (a) standardize fresh and cured pork on basis of firmness into classes, such as, for example, hard, firm, medium, soft, oily; (b) ascertain the extent of correlation between melting point of lard and the firmness of pork; (c) to determine the extent of correlation between firmness of the body of the live hog and the firmness of the pork from the hog; (d) follow the changes in quality of pork through different feeding periods on softening and hardening feeds; (e) perfect instruments for satisfactory extraction of small samples of fat from live hogs; (f) perfect an instrument for use in grading pork on the basis of firmness.

"Study of the Application of Standard Testing Apparatus for Use in Grading and Classing Pork," State, Hatch and local funds. This work is conducted in the highway testing laboratories of the Civil Engineering Department, School of Engineering, of the College, under the leadership of an associate professor of civil engineering. The object of this investigation is (a) to study methods of preparing and preserving meat samples for testing purposes; (b) study the application of the Dow penetrometer, or modification of that instrument, for testing the resistance to penetration offered by the connective tissue in various classes of pork; (c) study the application of the Vicat apparatus, or modifications of the apparatus, for testing the firmness of pork; (d) study the effect of temperature changes on the firmness of pork; (e) investigate the application of other testing methods with the view of using them for pork testing, and (f) to make tests upon numer-



The New Anti-Hog Cholera Serum Laboratory

ous designated meat samples, in order to establish by testing methods a definite dividing line between the several market classes of pork.

"Study of the Histology of Pork Fat," Hatch and local funds. To determine (a) the relative size of fat cells in hard and soft pork; (b) the thickness of cell walls of fats from hard and soft pork; (c) the relative amounts of muscular and connective tissues in hard and soft pork; (d) what difference exists in the connective and muscular tissues of hard and soft pork; (e) study the general histology of pork fat in its relation to the quality of pork. This work is being carried in co-operation with one of the associates in biology, of the School of Agriculture, of the College, under the cooperative agreement.

"Swine Feeding Investigation," State funds. To (a) obtain additional data on feeding cotton seed meal to hogs; (b) to compare peanut meal, tankage, cotton seed meal, wheat shorts, and cocoanut meal as supplements to corn in a fattening ration for hogs; (c) to determine the most economical amount of peanut meal to feed in the ration; (d) to determine what feeds will make soft or "oily" pork.

"Perfection of Pork Grading Instrument," State, Hatch and local funds. To (a) design an instrument for use in coolers to rapidly grade pork on the basis of firmness; (b) to make a working model of the instrument; (c) to apply the instrument in the cooler, standardizing it to grade on the basis of agreed grading line. This work is being done in the shops of the Mechanical Engineering Department of the College, by the Professor of Mechanical Engineering, and will be tested in coolers of the pork packing establishments.

"Influence of Water Consumption on Quality of Pork," State funds. The object of this investigation is to determine (a) whether or not a restriction in the amount of water consumption will yield a pork of different firmness from that produced where water consumption is at a maximum; (b) ascertain if the water consumption variation bears any relation to the quality of the pork produced; (c) make studies on the water content of pork of different qualities.

Entomology.

"Study of the Life-history, Habits and Bionomics of the Turnip Louse, together with Attention to the Development of Control Measures," Hatch fund. To determine the length of the various stages in the life-history of the insect, to observe the habits of the insect in its relation to plant foods, to determine its seasonal history, and to perfect control measures, thereby providing a means of saving the truck growers of Texas from heavy losses each year, due to the depredations of this insect pest.

"Life-history, Habits and Bionomics of the Harlequin Bug, with Attention to Control Measures," Hatch fund. To determine the length of the various stages of the life-history of the insect, its habits in relation to plant foods; to determine seasonal history, and to perfect control measures.

"Study of Weevils Infesting Peas and Beans," Hatch fund. A determination of the various insects infesting peas and beans in Texas,

both in field and in storage; the effect of temperature on the various species, and the development of improvement of control measures.

"Bionomical, Morphological and Systematic Study of Aphids," Adams fund. To determine (a) the species that occur in Texas and the life cycle of each, with special reference to alternate food plants of some of the most important species; (b) the factors which influence the formation of wings in aphids; (c) a systematic study of the genus *Aphis*."

"Study of the History, Habits and Control of the Sweet Potato Weevil or Borer," Hatch fund. To determine by cage studies the details of the life-history of this insect. The study will be supplemented by field studies, to determine the life cycle in the different localities, and attention will be paid to the development of satisfactory control measures.

"Study of the Green Bug or Spring Grain Aphis," State funds. This work was done by the Acting Professor of Entomology in the College, under the terms of the cooperative agreement with the School of Agriculture.

"Life-history and Methods of Control of the Pecan Twig Girdler," College funds. This study is being made by the Acting Professor of Entomology in the College, also under the terms of the cooperative agreement with the School of Agriculture, and the investigation is planned to determine the life-history of the insect, as well as methods of control.

"Study of the Life-history, Habits and Control of the Principal Insect Pests of the Peanut," Hatch fund. To determine by cage studies the life-history of the principal insect pests of the peanut. These studies will be supplemented by field studies, to determine the seasonal history of the pests, and studies will be made in different localities, in addition to the seasonal notes made at the Main Station. Efforts will be made to develop and perfect control measures.

"Studies of the Pecan Bud Moth," under the cooperative agreement with the School of Agriculture of the College, at no expense to the Station. This work will also be conducted by the Acting Professor of Entomology, and the object is to study the life-history of the moth, and ascertain methods of control.

The Entomologist of the Experiment Station is named by law as State Entomologist, and as such, under the direction of the Director, has charge of the enforcement of the foul brood law in Texas. Rules and regulations are issued from time to time, and the work of eradication of foul brood in honey bees is progressing in a very satisfactory manner.

Agronomy.

"Rate and Distribution of Seed and Time of Thinning Cotton," Hatch and State funds. To determine (a) what effect varying environment, as represented by rate and distribution of seed and time of thinning, has on the development of the plant and its characters; (b) what effect different spacings of plants in the row have on production, quality and market value of the crops; (c) whether or not a different distribution of plants has any effect on yield or quality of the crop; (d) the effect of deferred thinning on production.

"Crop Variety Test," State funds. To compare varieties and strains of the various farm crops of different classes for productiveness, quality, and other desirable characters. This includes the testing of corn, cotton, grain sorghums, legumes, sorghos, Sudan grass, and similar crops.

"Crop Improvement," Hatch and State funds. With the object (a) of the selection and testing of individual plants within a variety or species, and the propagation of such strains where desirable; (b) the study of pure lines so developed, with a view of interpreting the value of visible characters.

"Selective Inbreeding in Grain Sorghums and the Influence of Environment on the Plant," State and Hatch funds. To establish certain head types and to correlate the characters involved with each other and with productiveness; to determine the effect of environmental influences on the characters of the plants.

"The Effect of Environment on the Development of the Rice Plant," State funds. With the object (a) of studying the effect of water, in the form of either soil moisture, surface water, or water vapor, on the development of the rice plant; (b) the effect of varied temperatures on the rice plant, whether such temperatures exist in the soil, the surface water, or the air; (c) to determine the effect of wind movement on fertilization of the rice plant; (d) to study the effect of light on the development of the architecture of the rice plant.

"Oat Investigations," State and Hatch funds. To determine by experimental methods the highest yielding, the best adapted, and the most desirable oat for each locality. The information thus secured will be used to determine varieties best adapted to counties adjacent to the substations at Temple and Denton, and College Station, where this work is being conducted, or for counties in any part of Texas where the oat can be grown with profit.

"Study and Improvement of the Peanut," State funds. This work is conducted on the grounds of Substation No. 11, near Nacogdoches, under the supervision of the Division of Agronomy, by the Superintendent of the substation. Object (a) the improvement of the peanut plant in productiveness, quality, and other desirable characters. This study embraces not only the composition as regards nutrients contained, but also such qualities as the color of the seed coat, which may affect the value of the kernels for commercial purposes; (b) study of the peanut plant; its habits of growth; methods of production, and soil and fertilizer requirements, with the view to increasing the yield, quality, and market value of the strains developed.

"Time and Method of Intertillage," State and Hatch funds. To secure data as to the effect of intertillage and cultivation and presence and non-presence of weed growth, on the yield, nature, development, structure, composition, quality, utility, and ease of working of soils, and the moisture and other constituents of the soil, and their availability.

"Time and Method of Seed Bed Preparation," State and Hatch funds. To secure data as to the effect of plowing, tillage, presence and non-presence of weed growth, on the yield, nature, development, structure, composition, quality, utility, and cost, of crops; and on the

structure, nature, utility, and ease of working of soils; and the moisture and other constituents of the soil, and their availability. Field work is being done at the Main Station and at the substations.

"Rotation, Fertilizer and Soil Improvement Investigations," State and Hatch funds. To secure data as to the effect of the application of fertilizers, amendments, manure, green manure, and other substances, on the soil, and the effect of rotation, crop sequence, and crop management practices, on the soil; and as to the effect of drainage, irrigation, and other practices, on the soil; and to secure data as to the effect of these treatments or practices on the moisture and other constituents of the soil, and their availability; and on the structure, nature, utility and ease of working, of soils, and the presence or non-presence of weed growth; and on the yield, nature, development, structure, composition, quality, utility, and cost of crops grown on such soils.

"Plant Introduction," State and Hatch funds. The object of this work is to test the relative merits of newly introduced field crops. New introductions are tested not only for their agronomic and other practical values, but also for possible values in breeding work.

"Composting Raw Phosphate Rock and Sulfur with Different Soils," Hatch, State, and Council of National Defense funds. In accordance with a centralized plan announced by the Chief of the Office of Experiment Stations, at Washington, acting in conjunction with the Council of National Defense, this project is being studied in several States under the general title of "Cooperative Experiments Upon the Composting of Phosphate Rock and Sulfur." The object is to compost raw phosphate rock, and sulfur with Lipman's starter in several types of Texas soil, and observe the results produced in terms of (a) available phosphates; (b) plant growth produced when using the compost as a fertilizer.

Plant Pathology and Physiology.

"Pink Root of Onions," Hatch fund. Pink root is a disease which causes heavy losses to the onion growing sections of the State. The object of this investigation is to discover the cause of the trouble and to devise practical methods of control. It is intended also to study other onion root diseases which may be directly or indirectly associated with pink root. The field work is being done at Laredo, and the laboratory work at the Main Station.

"Diseases of the Watermelon and Their Control in Texas," Adams fund. A comprehensive study of the causes of failure of the watermelon crop, with a view to (a) devising scientific but practical methods of control by thorough investigation and determination of the causes of failure of the crop in Texas; (b) determining the cause of the sudden blighting of the melons at a stage when the plants seem to reach maximum growth; (c) determining the relationship of the sudden blighting to the disease known as "anthracnose"; (d) determining the cause of blossom-end, or nose-end, rot; (e) determining the life-history, physiology and morphology of *Collectotrichum lagenarium*, and the organism which causes blossom-end rot; (f) determining the pathological morphology, physiology, and cytology, of the affected host; (g) working out any other root, foliage or fruit trouble that may be new, and of economic

importance, bearing in mind especially the cotton root rot disease; (h) determining the relationship of the organisms which cause disease in watermelons, to those of the cantaloupe, squash, pumpkin, and other ornamental cucurbits; (i) determining the relationship of climate to severity of the disease, by means of weather and hygrothergraphic studies; (j) developing resistant strains or varieties; (k) determining the advisability of spraying as a practical means of control; (l) determining the field methods and practices which tend to keep in check, or to increase, the diseases of the watermelon and other cucurbits. This work is being carried out at Prairie View, in co-operation with the State Normal and Industrial Institute branch of the institution, where land, care, and labor on plants, are donated by that institute.

"Diseases of the Sweet Potato and Their Control in Texas," Adams fund. To determine the diseases of the sweet potato in Texas, with a view to devising methods of control. This project aims, further, at investigating present storage methods, in order to devise better means of keeping potatoes, to prevent loss from rot. The particular troubles to be investigated first are "pox" and "blackleg," and in addition, such other troubles as may be encountered.

"Texas Root-Rot Investigations," Adams fund. To discover the cause or causes of Texas root-rot diseases of cotton, sweet potatoes, alfalfa, cowpeas, and other plants, with a view to developing methods of control. This work is being conducted at the substation near Temple, and the laboratory work is being done at College Station. It is planned (a) to determine the role of the fungus *Ozonium omniverum* in producing the root rot, by inoculation studies with pure cultures of the fungus in both greenhouse and laboratory, and also in the field under natural conditions; (b) to work out the life-history of the fungus, with a view to determining the various stages of the parasite; (c) to determine the range of various hosts susceptible to the fungus, confining such studies to cotton, sweet potatoes, alfalfa, and other truck or fruit crops that may be of assistance in solving the problem; (d) to determine the effect of weather and various cultural methods in increasing or decreasing root rot; (e) to study other root rot parasites which are mistaken for Texas root rot; (f) to determine the advisability of treating infected soils with chemicals; (g) the development of strains or varieties of affected crops which may be resistant to the root rot.

Poultry Husbandry.

"Comparing Cottonseed Meal, Meat Scrap and Sour Skim Milk as Sources of Protein for Fowls," State and local funds. The object of this test was to secure information as to the most economical source of protein for poultry feeding.

"Feeding for Egg Production," State and local funds. To determine (a) whether or not rations composed entirely of vegetable feed can be fed as profitably as rations composed in part of animal feed; (b) to determine the relative values of skim milk, cottonseed meal, meat scrap, and peanut meal for poultry feeding.

"Egg Preservation," State and local funds. To determine whether or not it is profitable to preserve eggs for home use.

"Cockerel Fattening," State and local funds. To determine (a) whether or not it is profitable to fatten surplus cockerels for the market; (b) to ascertain the length of time poultry can be fed with profit to the feeder; (c) to determine the amount of flesh that can be added to each 100 pounds of live weight, with profit to the feeder; (d) to determine the cost of each pound of weight added; (e) to study the relative shrinkage between fattened and range cockerels when shipped to market.

"Fowl Fattening," State and local funds. To determine (a) whether or not it is profitable to fatten cull pens for market; (b) to determine the length of time such fowls may be fed with profit; (c) to determine the cost of each 100 pounds of live weight added with profit; (d) the cost of each added pound, and (e) the relative shrinkage between fattened and range hens when shipped to market.

"Comparison of Dry Mash and Wet Mash for Poultry Feeding," State and local funds.

Considerable progress has been made in the erection of buildings, the laying out of plats for grazing crops for poultry, and in securing equipment.

Forestry.

"Introduction and Propagation of Forest and Shade Trees in Different Regions of Texas," State funds. This work is being carried at the various substations, with the view to determining which native American and exotic trees are most suitable to introduce into the widely varying soil and climatic conditions of Texas, for fence posts, shelter belts, fuel and shade purposes; and under what methods of pruning, spacing, and general nursery practice and planting methods, the best results in growth, form and vigor may be expected.

The Forester of the Experiment Station is also State Forester, under the law.

Dairying.

"Value of Peanut Meal as Compared to Cottonseed Meal When Fed to Dairy Cows," State and local funds. This work was conducted on the feeding and breeding substation, near the College. The object of the investigation was to ascertain the influence of peanut meal upon milk production, as compared to cottonseed meal, to note the difference in the feed cost of milk production as between these two products, and to discover any physiological objections which may be found in connection with peanut meal as a dairy feed.

"Cotton Seed Meal vs. Cocoanut Meal for Dairy Cows," State and local funds. To (a) compare the relative milk producing value of cotton seed meal and cocoanut meal, (b) ascertain the relative effects of cocoanut meal and cotton seed meal on the percentage of butter-fat, (c) ascertain the relative effects of cocoanut meal and cotton seed meal on butter-fat production.

"Cotton Seed Meal vs. Peanut Meal," State and local funds. To (a) compare the relative value of peanut meal and cotton seed meal for milk production when fed to dairy cows, (b) compare the palatability of peanut meal and cotton seed meal for dairy cows, (c) to compare

the value of peanut meal and cotton seed meal for butter-fat production, (d) to make note of any difference in physiological effects of the two feeds, or any other observations of value.

"Methods of Preparation of Velvet Beans for Dairy Cows," College funds. This work is being conducted at the College Dairy plant, under the co-operative agreement with the School of Agriculture, under the supervision of the Professor of Dairying, in the College. The object is (a) to compare the influence of methods of preparation of velvet beans on milk production, (b) to compare the influence of methods of preparation of velvet beans on percentage of butter-fat and butter-fat production, (c) to study the influence of methods of preparation of velvet beans on palatability.

In addition to the work outlined, considerable work of a development nature has been done. A foundation herd of Jerseys has been acquired, and progress has been made in the matter of getting the Division of Dairying firmly established.

Plant Breeding.

"Fundamental Study of Inheritance in Cotton," Adams and State funds. A determination of the Mendelian unit characters of inheritance in cotton, or their behavior in inheritance, so as to produce various desirable combinations, such as earliness and prolificacy, drouth resistance and earliness, disease resistance and earliness, storm-proofness and earliness, and so forth. At first only one pair of characters will be studied and later on two pairs of unit characters will be studied at the same time. In order to make the work more thorough and comprehensive in scope, it is the plan to make comparative studies of the unit characters of given varieties and species upon different soil areas in the State.

"Oil Inheritance in Cotton," is being carried under the Adams and State funds, as a sub-project of the cotton inheritance investigation. The object of this sub-project is the establishment of strains of cotton which give high or low oil analysis, and the collection of data that will assist in the unit character investigations. The work is also expected to furnish strains of cotton of commercial value. Pure line selection and hybridization, based on oil analysis, and guided by correlations and regression studies of parents with offspring, will be made. The hybridization will necessarily wait until pure biotypes for oil production are produced. The Chemist of the Station will make the chemical analyses.

Feed Control Service.

The Twenty-ninth Legislature of Texas passed an Act—

- (1) Regulating the sale of concentrated commercial feeding stuffs and the materials from which they are manufactured.
- (2) Defining them.
- (3) Prohibiting their adulteration.
- (4) Providing for their correct weighing and marking.
- (5) Providing for the collection of samples.
- (6) Providing for the expenses of enforcing the law.
- (7) Fixing penalties for violations.

(8) Empowering the Director of the Agricultural Experiment Station (a) to adopt standards, names and definitions; (b) to refuse registration of any feeding stuff under a name which would be misleading as to the materials of which it is made up, or which does not conform to the standards, names and definitions in effect, and (c) after ten days' notice, to cancel such registrations as may be from time to time found in violation of the law, or contrary to the names, standards and definitions adopted by the Director.

The purpose of the Feed Control Service, which is operated as a division of the Experiment Station, is to afford protection alike to buyers and sellers of feeding stuffs. The seller is protected by the development of uniform standards which eliminate unfair competition. He is expected to comply with the law, not merely for the sake of compliance, but because in the long run it is the wisest course. The seller who habitually complies with the law has the confidence of the feeders and the general public, and avoids the unnecessary expense and the unsavory reputation incident to prosecution for violating the feed law.

By a comparison of the constituents of the feeding stuff, from the information printed on the tax tag attached to the bag or parcel, the buyer of feeding stuffs is enabled to determine for himself which is the cheapest and best feed to use, his particular needs considered.

Annual bulletins are issued, giving the names, definitions and standards for various feeding stuffs, together with names of firms registered for the purpose of selling feeding stuffs in Texas; a list of the feeds offered, with their chemical composition as determined by the chemist for the Feed Control Service. Discrepancies in guarantees are also shown, and from these bulletins it is an easy matter for one to determine the correct nature and value of a given feed.

The Feed Control Service is continuously investigating problems which are encountered in the enforcement of the law, with reference to the feeding values of various feeds and feeding combinations. The results of these investigations are given to the people of the State from time to time through bulletins, circulars and reports.

SUBSTATIONS.

In addition to the Main Station, the State owns and operates a system of substations, consisting of thirteen experiment farms, located in as many agricultural regions of the State. As their name implies, they are subordinate to and a part of the Main Station. In the selection of sites for these substations, due consideration has been given to the need of outlying work within the several agricultural regions. The substations are as follows:

No. 1, Beeville, Bee County. Established originally for truck farming experiments, but modified in later years to include work in general agriculture.

No. 2, Troup, Smith County. Established primarily as a fruit substation, but now includes work with vegetables and field crops.

No. 3, Angleton, Brazoria County. Devoted to general crops and crop production problems under poor drainage conditions. Especial attention is being given to forage crops and plant introductions.

No. 4, Beaumont, Jefferson County. Primarily a rice station, but the work has been extended to include problems pertaining to general farming.

No. 5, Temple, Bell County. Crop production and plant introduction studies are being made under root rot conditions.

No. 6, Denton, Denton County. Originally a small grain substation, but the work has been extended to cover the various farm problems of the section.

No. 7, Spur, Dickens County. Devoted to dry-land farming in the eroded Plains region, and certain sheep feeding and breeding problems.

No. 8, Lubbock, Lubbock County. Devoted to dry-farming and irrigation problems in the South Plains. Special investigations in grain sorghum improvement are also being carried here, and plant introduction studies are being given special attention.

No. 9, Pecos, Reeves County. Devoted to irrigation under alkali conditions, and plant introduction studies.

No. 10, the Feeding and Breeding Substation, near the College, was located here in order to have the investigations in feeding and breeding as close as possible to the College. This substation is devoted to the feeding and breeding problems with live stock, particularly cattle, hogs and poultry. By virtue of its location, this substation is particularly beneficial to students of animal husbandry.

No. 11, Nacogdoches, Nacogdoches County. Originally a tobacco substation, but now includes work on various problems pertaining to the general agriculture of Eastern Texas.

No. 12, Chillicothe, Hardeman County. Operated in co-operation with the Office of Forage Crops, United States Department of Agriculture. Devoted to the various dry-farming problems of this section of the State, and plant introduction.

No. 14, near Sonora, in Sutton and Edwards Counties. This is the Angora Goat and Sheep Substation, and is located in the heart of probably the greatest goat and sheep growing region of the country. Much development work, preliminary to actual investigation, has been done on this substation.

For more detailed information as to the progress and work of the various substations, reference is here made to the annual progress reports of the substations, published as regular bulletins of the Station.

COOPERATION.

In accordance with our fixed policy of cooperating wherever cooperation is mutually advantageous, the following memoranda of cooperation have been continued:

1. With the Office of Dry-Land Seed Distribution, United States Department of Agriculture, for cooperative work in the dissemination

of seeds of dry-land crops suitable to Texas conditions. Under this arrangement large quantities of valuable seeds have been placed with Texas farmers, and it is expected that this work will become especially important during the present war.

2. With the Office of Forage Crops, United States Department of Agriculture (a) in the operation of Substation No. 12, Chillicothe; (b) in special forage crops studies by Professor S. M. Tracy, at the Angleton substation, and (c) in general forage crops investigations throughout the State.

3. With the Office of Foreign Seed and Plant Introductions, United States Department of Agriculture, for the introduction, propagation and testing of newly introduced plants giving promise of becoming valuable in Texas.

4. With the Office of Cotton and Truck-Diseases and Sugar-Plant Investigations, United States Department of Agriculture, for general work on plant diseases in Texas, and for a plant disease survey of the State.

5. With the Office of Horticultural and Pomological Investigations, United States Department of Agriculture, for the propagation and distribution of rosaceous fruits in Texas.

6. With the Bureau of Soils, United States Department of Agriculture, for cooperative soil surveys in Texas.

7. With the National Council of Defense, in the prosecution of a study on the composting of raw phosphate rock and sulfur with different soils.

8. With the School of Agriculture of the Agricultural and Mechanical College, wherein Station men may give lectures to students and teachers may do cooperative investigation work on the Station. Under the terms of this cooperation, investigation work is being conducted in horticulture and entomology.

9. With the School of Engineering, this College, wherein certain of the professors may cooperate in agricultural studies involving engineering problems.

10. With the School of Veterinary Medicine of the College, wherein the Dean of the School of Veterinary Medicine heads the Division of Veterinary Science on the Station.

11. With the Extension Service of the institution, whereby extension workers from time to time suggest to the Station the more important problems of the farmers and stockmen throughout the State. In this manner some of the most important investigations of the Station have been suggested.

PUBLICATIONS.

The publications of the Station, as usual, have met with a very great demand, and have received a wide distribution. In addition to a mailing list of agricultural colleges and experiment stations, libraries, and scientific workers, to whom copies of all publications are sent, there is issued and distributed to all the names on all lists, a quarterly list of available publications. Requests are then made by the recipients for the publications desired. In this way unnecessary and wasteful distri-

bution of the publications is avoided. Wherever possible, however, publications are sent to all those who desire them.

The following is a list of the publications issued, together with the number of copies in each issue, published during the biennium:

Name		Number copies printed
Bulletin No.	194	10,000
	195	20,000
	196	10,000
	197	7,500
	198	15,000
	199	10,000
	200	10,000
	201	15,000
	202	12,000
	203	10,000
	204	8,000
	205	12,000
	206	12,000
	207	15,000
	208	15,000
	209	12,000
	210	15,000
	211	10,000
	212	10,000
	213	10,000
	214	15,000
	215	15,000
	216	6,000
	217	10,000
	218	9,000
	219	10,000
	220	10,000
	221	10,000
	222	10,000
	223	10,000
	224	20,000
	225	7,500
	226	8,000
	227	10,000
	228	8,000
	229	10,000
	230	10,000
	231	10,000
	232	6,000
		<hr/>
		433,000
Circular No.	17	10,000
	18	7,500
		<hr/>
		17,500

Name	Number copies printed	
Control Circular "A".....	5,000	
"B"	5,000	
		10,000
Four separate issues of unnumbered press bulletin "Publications Available for Free Distribution," 30,000 copies to each edition.....	120,000	120,000
Twenty-ninth Annual Report.....	7,500	7,500
		<hr/>
Total copies printed.....		568,000

SUMMARY.

Bulletins	39
Regular circulars	2
Control circulars	2
Press bulletins	4
Annual reports	1
	<hr/>
	48

The following is a complete list of the publications available for distribution at this time:

124. The Pecan Case Borer.
126. Active Phosphoric Acid and Its Relation to the Needs of the Soil for Phosphoric Acid in Pot Experiments.
128. Cotton Seed Meal as Human Food.
129. Studies of the Ammonia Soluble Organic Matter of the Soil.
141. Commercial Feeding Stuffs.
148. Report on Experiments with Citrus Fruits at the Beeville Substation.
159. Steer Feeding.
160. Commercial Fertilizers in 1912-13.
162. Composition and Digestibility of the Chloroform Extract of Texas Hays and Fodders.
163. Digestion Experiments on Men with Cotton Seed Meal.
164. Commercial Feeding Stuffs.
165. Ammonia-Soluble Inorganic Soil Colloids.
166. Digestion Experiments with Texas Feeding Stuffs.
167. Commercial Fertilizers and Their Use.
168. Commercial Fertilizers in 1913-14.
169. The Total Fatty Acids and Other Ether Soluble Constituents of Feedstuffs.
170. Texas Feeding Stuffs: Their Composition and Utilization.
171. Losses of Moisture and Plant Food by Percolation.
172. Sudan Grass.
173. The Composition of the Soils of the Texas Panhandle.
174. The Effect of Organic Compounds in Pot Experiments.
175. Distribution and Digestibility of the Pentosans of Feeds.
176. Commercial Fertilizers in 1914-15.

177. Commercial Feeding Stuffs in 1914-15. The Texas Feed Law.
178. Effect of the Additions on Availability of Soil Phosphates.
180. The Turnip Louse.
181. Oxidation of Organic Compounds in the Soil.
182. Steer Feeding.
183. Moisture Relations of Some Texas Soils.
184. Cooperative Fertilizer Experiments with Corn, 1908-14.
185. The Production Co-efficients of Feeds.
186. Fattening Lambs.
187. Sprays and Spraying.
188. Tile Drainage.
189. The Composition of Cotton Seed Meal and Cotton Seed.
190. The Effect of Additions on the Availability of Soil Potash, and the Preparation of Sugar Humus.
191. The Composition of Rice and Its By-Products.
192. Soils of Grayson, Lee, McLennan, Titus, and Tyler Counties.
193. Commercial Fertilizers in 1915-16.
194. Commercial Feeding Stuffs, 1915-16.
195. Japanese Sugar Cane as a Forage Crop.
196. Digestibility of Sugars, Starches, and Pentosans of Roughages.
197. Progress Report, Substation No. 3, Angleton, Texas, 1909-14.
198. Feeding Baby Bees.
199. Progress Report, Substation No. 6, Denton, Texas, 1909-14.
200. Progress Report, Substation No. 4, Beaumont, Texas, 1909-14.
201. Peanut Meal and Ground Whole Pressed Peanuts for Hogs.
202. Progress Report, Substation No. 12, Chillicothe, Texas, 1905-14.
203. The Productive Values of Some Texas Feeding Stuffs.
204. The Recurving of Milo and Some Factors Influencing It.
205. Sheep Breeding and Feedings.
208. The Fig in Texas.
209. Progress Report, Substation No. 2, Troup, Texas, 1909-14.
210. Barns for Work Animals.
211. Field Experiments with Crown Gall, 1913-17.
212. The Availability of Phosphoric Acid in Rock Phosphates.
213. The Composition of the Soils of South Central Texas.
214. Progress Report, Substation No. 1, Beeville, Texas, 1910-14.
215. Progress Report, Substation No. 5, Temple, Texas, 1910-14.
216. Commercial Feeding Stuffs, 1916-17.
217. Commercial Fertilizers in 1916-17.
218. Progress Report, Substation No. 7, Spur, Texas, 1909-14.
219. Progress Report, Substation No. 8, Lubbock, Texas, 1909-14.
220. Egg-producing Values of Some Texas Feeding Stuffs.
221. Progress Report, Substation No. 9, Pecos, Texas, 1910-14.
222. The Composition of Peanuts and Peanut By-Products.
223. Effects of Lime and Carbonate of Lime on Acid Phosphate.
224. The Influence of Peanuts and Rice Bran on the Quality of Pork.
225. Coconut Meal vs. Cotton Seed Meal for Dairy Cows.
226. Cooperative Soft Pork Investigations.
227. Studies on the Harlequin Bug.
228. Influence of Peanut Meal on Quality of Pork.

- 229. Experiments at Substation No. 3, Angleton, Texas, 1909, 1916.
- 230. Spacing of Rows in Corn and Its Effect on Grain Yield.
- 231. The Beemoth or Waxworm.
- 232. Mineral Requirements of Sheep.
- 233. Commercial Fertilizers in 1917-18.
- 234. Commercial Feedings Stuffs in 1917-18.
- 235. Cooperative Fertilizer Experiments with Cotton, Corn, Sweet Potatoes and Irish Potatoes, 1908-17.

Annual Reports.

Twenty-fifth, twenty-sixth, twenty-seventh, twenty-eighth, twenty-ninth.

Press Bulletin.

"Broom Corn Culture," by A. B. Conner.

Circulars—New Series.

- 3. Truck Farming in Texas.
- 7. Insect Enemies of Sudan Grass.
- 9. The Story of Three Pigs.
- 10. Housing Farm Implements (superseding No. 4).
- 12. Progress in Peanut Milling.
- 13. The Green Bug or Spring Grain Aphis.
- 15. A Milk House for Texas.
- 16. Directions for Preparation of Veterinary Specimens for Examination.
- 17. The Texas Foul Brood Law and Foul Brood Regulations.
- 18. The San Jose Scale.

CORRESPONDENCE.

The correspondence of the Station workers with farmers, stockmen and other citizens, has again decreased during the years reported upon, for the reason that with the expansion of the Extension Service this work has been taken over very largely by that branch of the institution. This greatly relieves the Station workers, and allows them more time for investigation, and this has had a very marked effect upon the effective correlation of the researches and investigations under way, and has greatly facilitated the compilation and publication of results secured.

Accurate count of all letters sent out by the Station men is kept by months, and the following is a statement of these letters, by years, for the biennium just closed:

1916-17	28,131
1917-18	28,487
Total for biennium.....	56,618

STATION LANDS.

The following is a statement of the lands owned by the State and devoted to Experiment Station work:

Location.	Owned by Station. Acres.	College land used for Station purposes. Acres.
Beeville.....	151.5	
Troup.....	150	
Angleton.....	157	
Beaumont.....	100	
Temple.....	96	
Denton.....	203	
Spur.....	160	
Lubbock.....	160	
Pecos.....	80	
Feeding and Breeding.....	265.8	543
Nacogdoches.....	82	
Chillicothe.....	100	
Sonora.....	3200	
Main Station Agronomy Farm.....		127
Veterinary Science Division of Main Station.....		141
Totals.....	4905.3	811

Total number of acres of land operated by Experiment Station..5716.3

DISTRIBUTION OF STATION PROPERTIES.

The Texas Agricultural Experiment Station system includes the Main Station at the College and thirteen articulated substations in as many sections of the State. The Main Station comprises administrative officers and the offices, laboratories and greenhouses of the several specialists. In addition to these, there is an experiment farm, which is nothing more than an outdoor laboratory, supplementary to the indoor work. The necessity for substation farms in the various agricultural regions of the State should be obvious. If all the Station work were confined to the central Station laboratories and farms at the College, the results would hardly be applicable throughout the State. The function of the substation farms, therefore, is to extend the work of the specialists at the central Station to the various agricultural regions of the State. In this regard, the work of the Texas Station is better distributed, possibly, than that of any other State.

Respectfully submitted,

B. YOUNGBLOOD,
Director

REPORT OF THE DIRECTOR OF THE TEXAS ENGINEERING
EXPERIMENT STATION.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: Four years ago the Texas Engineering Experiment Station was organized for the purpose of extending to the industries of the State, to the greatest extent possible with the facilities at hand, services similar to that offered by the Texas Agricultural Experiment Station. It is composed of all the engineering departments of the College and its staff is made up of the entire engineering staff of the College.

The following bulletins have been issued by the Station:

No. 1. February, 1915. Earth Roads, by R. L. Morrison.

No. 2. March, 1915. The Relation and Value of Chemistry to Industry, by H. B. Gordon.

No. 3. April, 1915. The Comparative Value of Fuels, by M. H. Thornton, Jr.

No. 4. May, 1915. Highway Bridges and Culverts, by B. K. Coghlan.

No. 5. July, 1915. Highway Engineering at the Agricultural and Mechanical College of Texas, by R. L. Morrison (superseded by No. 14).

No. 6. October, 1915. Household Conveniences and How to Make Them, by C. E. Hanson.

No. 7. August, 1915. Gravel Roads, by B. K. Coghlan.

No. 8. September, 1915. Electricity in the Country Home, by F. C. Bolton.

No. 9. October, 1915. Cotton Classing and Marketing, by J. B. Bagley.

No. 10. November, 1915. Sewage Disposal for Country Homes, by Dan C. Miller.

No. 11. December, 1915. Purchasing by Specifications, by W. P. Nelson, Jr.

No. 12. January, 1916. Demonstration Roads at the A. and M. College of Texas, by R. L. Morrison. (Out of print.)

No. 13. August, 1916. The Financial Side of Road Improvement, by B. K. Coghlan.

No. 14. October, 1916. Highway Engineering at the A. and M. College of Texas, by R. L. Morrison.

No. 15. November, 1916. The Organization of a State Highway Department of the State of Texas, by B. K. Coghlan. (Out of print.)

No. 16. March, 1917. Maintenance of Earth, Sand-Clay and Gravel Roads, by R. L. Morrison.

No. 17. June, 1917. The Physical Testing of Non-Bituminous Road Materials, by Roy M. Green.

No. 18. July, 1917. The Benefits of Good Roads, by R. J. Potts.

No. 19. November, 1917. Sand-Clay Roads, by B. K. Coghlan.

No. 20. March, 1918. The Value of Applied Geology, by D. R. Semmes.

The engineering teaching staff has been so heavily loaded with other work that it has been difficult to find time for the necessary investigations and the preparation of manuscript, especially during the last year, and as a result only two bulletins have been issued since November 1, 1917. The funds available in the several engineering departments have not sufficed for more than immediate needs of instruction work, so that no special investigations have been carried to completion. The highway engineering and materials testing laboratories have made quite a number of tests of materials, and a series of investigations on bituminous paving and paving materials is in progress in the bituminous laboratory, but, with the exception of two bulletins prepared by members of the teaching staff of the Department of Chemistry and Chemical Engineering, all the bulletins issued during the last three years have been prepared by teachers in the Civil Engineering Department.

Two years ago the Professor of Chemistry and Chemical Engineering recommended the employment of a special chemist whose chief duty would be to co-operate with the purchasing agent and departments buy-in supplies under specifications and to determine whether or not the supplies delivered came up to the specifications under which they were bought. On pages 114 and 115 of the twentieth biennial report of the College will be found Professor Hedges' recommendation, quoted at length by my predecessor, the late Dean Spence. I desire to repeat the endorsement of the plan given by Dean Spence, with the suggestion that a better salary be provided than was suggested by Dr. Hedges, in order that a better qualified man may be secured than would now be possible for the salary then thought adequate.

I recommend, also, that an annual appropriation of \$5000 for each of the next two fiscal years be requested of the Thirty-sixth Legislature, in order that some funds for investigation be made available, these funds to be allotted to the different engineering departments by yourself upon recommendation of the Director, who would be responsible for the proper and effective expenditure of same. Bills have been introduced in Congress looking to the establishment of Engineering Experiment Stations in the several States, but the death of Senator Newlands, of Nevada, has delayed action on any of them and has been followed by the introduction of other bills, of which the Smith-Howard bill is the latest. Should this bill pass, the logical place for the Texas Station is here at the Agricultural and Mechanical College where a substantial beginning has already been made.

Respectfully submitted,

J. C. NAGLE,

Dean of Engineering and Director Texas Engineering
Experiment Station.

REPORT OF THE DIRECTOR OF EXTENSION SERVICE.

September 1, 1918.

President W. B. Bizzell, Campus.

The last annual report of the Extension Service of the Agricultural and Mechanical College of Texas for the calendar year 1917, outlined the projects for the biennium of 1917-19, and it was the purpose of this service to continue the work along the lines outlined in the report of 1917.

The drouth and emergency work has evolved many unusual conditions in the State and various problems have presented themselves for solution. The securing and proper distribution of seed; the bringing together of farmers with feed and no cattle, and livestock producers with cattle and no feed; the producing of food and feed to meet the increased demands of the nation with the limited man power in rural communities from the call to arms; the installing of a more equitable cotton marketing plan; co-operating with the Food Administrator in the conservation of food; working with the State and National Councils of Defense; the solution of the labor problems in the various sections of the State; co-operating in the Liberty Loan Drives and War Savings Stamps, Y. M. C. A., as well as the Red Cross activities; the placing of emergency agents; the determining of rations under existing conditions most desirable for poultry and livestock; the saving from slaughter of the foundation breeding stock of poultry, cattle, sheep and hogs of the State; the directions of campaigns for the erection of adequate silos, increasing wheat production, seed selection, poultry production, swine production, the raising of our own sweets and the canning, preserving, pickling and drying of our field products; the storing and marketing of potatoes; the production and marketing of infertile eggs; the eradication and control of diseases and insect pests, and many other activities for the improvement of agricultural conditions and rural developments, have kept the extension forces busily engaged with a twelve-hour program for each day's work and only a limited number of hours to accomplish the task.

PROJECTS.

The projects conducted for the fiscal year 1917-18, with the distribution of funds, are shown in the following budget, adopted and approved by the Washington authorities:

APPROPRIATIONS.

U. S. Department of Agriculture for County and Home	
Demonstration Agents, Boys' and Girls' Work, etc.....	\$ 69,000.00
U. S. Smith-Lever Fund.....	105,919.11
State Smith-Lever	95,919.11
Emergency appropriations	148,000.00
	<hr/>
	\$418,838.22

DISBURSEMENTS.

Project.	Federal.	State.	U. S. D. A.	Emergency.
1. Administration.....	\$ 20,448 51	\$ 750 00	\$ 216 00	.....
2. Publications.....	6,091 11	3,999 11		.....
3. County Agent Work.....	38,551 14	28,818 35	59,756 01	\$ 113,777 85
4. Boys' Club Work.....	3,568 35	1,731 65	900 00	5,668 22
5. Negro Extension Work.....	4,210 00	5,500 00	120 00	.....
6. Home Economics.....	8,166 00	15,930 00	8,007 99	28,553 93
7. Extension Schools.....	5,056 00	8,060 00		.....
8. Animal Husbandry.....	2,136 00	8,580 00		.....
9. Creamery Work.....	1,248 00	420 00		.....
10. Dairy Extension.....	384 00	1,220 00		.....
11. Rural Economics.....	8,886 00	9,230 00		.....
12. Plant Industry.....	7,138 00	13,680 00		.....
Total.....	\$ 105,919 11	\$ 95,919 11	\$ 69,000 00	\$ 148,000 00

ADMINISTRATION.

Notwithstanding the fact that the funds have been greatly increased in other projects and emergency appropriations have had to be handled by the administrative forces, yet there has been a very small increase in the administration funds. While the duties of the administration have increased in ratio with the increased total funds, yet the work has been distributed in such a manner that practically the same number of employes have been able to perform the extra work involved.

During the early part of 1917 our director was called to Washington and the assistant director has been the acting director the major portion of the time covered by this biennial report.

The administrative project includes part salaries of the director, acting director, chief clerk, editor of publications, contingent fund, janitor's service, office supplies and the clerical help required in the central office.

Up to July 1, 1918, the activities of the department were split into divisions, with a chief or leader at the head of each, through whom the director deals with his employes. These divisions were:

1. Farm Demonstration Division (including the boys, girls and negro work.)
2. Rural Economics Division.
3. Animal Industry Division.
4. Plant Industry Division.
5. Rural Women's Division.
6. Movable School Division.

The biennial report for 1915-16 gave the following details: In addition to the chief, there were five district agents, one special agent and ninety county agents in the men's division of the Farm Demonstration work; one State agent, one assistant agent, two district agents and thirty-five county agents in the girls' division of the Farm Demonstration work; one State agent in charge of Boys' Agricultural Activities, also attached to the Farm Demonstration Division. There has been one organizer, one agronomist and one home economics demonstrator in the negro division.

There were five men in the Rural Economics Division, five in the Animal Husbandry Division, exclusive of the government hog cholera

specialist who cooperates with them; five men in the Plant Industry Division; one woman in the Rural Women's Division and three women and one man specialist in the Movable School Division.

The demand for specialist work has grown to such proportion and the placing of county agents during the emergency as well as the normal growth of the county agent work made it necessary to change the administrative policy. It has been the policy of the department to stress definite demonstration work and project work rather than propaganda work which conditions previously demanded. To prevent duplication and promote greater efficiency in the cooperation of the specialists and the demonstration forces, it was deemed advisable to appoint a State leader of specialists, whose duty involves the supervision and direction of the activities of the specialists in his division and consulting with the director or his representative upon all questions pertaining to his division.

It was also deemed advisable to appoint a State leader of demonstration forces with similar duties regarding district and county agents as well as agricultural club specialists.

These two special agents act in the capacity of assistants to the directors, and may become acting director when the occasion demands.

The demands for specialists' work have grown until there are, at present, twenty-three white State specialists and one State agent, who draw the larger portion of their salary from government funds. There are ten district Farm Demonstration agents and one State agent. Two hundred and five Farm Demonstration agents and assistants, one Boys' State Agricultural Club agent, one State Pig Club agent, and two Boys' Agricultural Club specialists. There is one State Home Demonstration agent, five district Home Demonstration agents, fifty-seven Home Demonstration agents, five white women specialists and one woman in the Rural Women's Division, besides a number of cooperating government specialists who draw their entire salary from the government funds. There have also been a number of temporary United States Department of Agriculture specialists during the emergency cooperating with the service in the solution of the various emergency and war-time problems.

During the summer of 1917 young ladies from the University of Texas, College of Industrial Arts, Denton Normal School, Sam Houston Normal, San Marcos and Canyon City Normal, volunteered their services in an emergency food campaign. Organizations were perfected, and 371 volunteer demonstrators served throughout the canning season. As a direct result of this campaign, 2,474,000 containers of food were saved and 5420 people were influenced to conserve foodstuffs. The young women who volunteered for this service served without pay and deserve the highest praise for their patriotic zeal. The promptness with which this large force of volunteer workers was trained and mobilized for service is a tribute to the efficiency of the educational institutions from which they came and another evidence of the value of cooperative effort for the public welfare.

The office scheme involves the handling of all correspondence, bulletins, circulars, itineraries, etc., by the central office, all letters being numbered, and where special questions are involved, referred to the specialist handling that line of work for answer. The volume of corre-

spendence is constantly increasing. The records show that for the past two years 100,463 letters of inquiry were received and answered by the service in addition to thousands of postal cards and other standard forms of handling a vast volume of correspondence. Since each letter required an answer, this would mean the handling of approximately 200,926 letters through the files.

CENTRAL OFFICE FORCE.

Following is a summary of the staff force, not including the Farm Demonstration and Home Demonstration agents:

One acting director.

Two white men State agents.

Ten white men district agents.

Four men agricultural club specialists (white).

Twenty-three white men Extension Staff specialists.

Six U. S. D. A. white men specialists cooperating.

One woman State Home Demonstration agent.

Six white women district agents.

Five white women specialists.

Three negro men specialists.

One negro woman specialist.

Editor publications.

Chief clerk.

Bookkeeper.

Assistant bookkeeper.

Correspondence clerk.

Foreman mailing room.

Bulletin clerk.

Thirteen stenographers.

One negro janitor.

PRINTING AND DISTRIBUTION OF PUBLICATIONS.

It has been our policy to print bulletins on subjects only peculiar to Texas conditions and to make these as brief as clarity and subject matter would permit. The United States Department of Agriculture publications have been used to cover all general farm problems.

Seventy circulars under the classification of Farm and Home Hints, ranging from one page to six pages each, have been published on the important seasonal subjects for free distribution, while fifty-two issues of the Semi-Monthly Farm News have been distributed to our regular mailing list of approximately 10,000 each issue. A weekly press letter has also been mailed to the papers of Texas containing articles on timely subjects for the information of the farmers.

In addition to the foregoing a number of posters, placards, etc., have been printed and distributed where they would accomplish the greatest good according to the subject matter.

It has been the policy of the publications division to publish of new publications in the Semi-Weekly Farm News and the Texas press and send publications only upon request, since the maintaining of a bulletin mailing list would involve considerable useless expense and the waste

of good literature. Take for example, John Doe writes in to be placed on our bulletin mailing list. He is interested in poultry. Another is interested in dairying, etc. Bulletins on other subjects would probably not appeal to these men, yet we would soon build up a list, making it necessary to print thousands of each publication. Furthermore, all the county and home demonstration agents, as well as libraries and college instructors are making constant requests for all publications and to maintain a bulletin mailing list for these alone would mean the printing of several extra thousand bulletins. But where a man is sufficiently interested in a subject to write a letter the publication will probably prove valuable to him.

Our funds for printing and distribution are limited by the terms of the law to 5 per cent of the total appropriations. Experience shows that this is ample, provided proper economy is practiced in the distribution of bulletins.

EXTENSION SPECIALISTS.

On July 1, 1918, the three divisions of Animal Husbandry, Rural Economics and Plant Industry were abolished, and one Specialists Division was established. Mr. W. B. Lanham was appointed State agent, and the work was reorganized along the following lines:

Animal Husbandry. Under a cooperative agreement with the Federal Bureau of Animal Husbandry, a specialist of Animal Husbandry was employed jointly between the extension service and the bureau and under this leadership was included the beef cattle specialist, hog specialist, sheep and goat specialist and poultry specialist. So far the time of the State leader in Animal Husbandry has been almost entirely taken up along the lines of distributing beef cattle from the drouth-stricken portion of the State to parts of this and other States where feed was more plentiful. The buying of cattle, both on the range and on the Fort Worth market has been encouraged. Mr. C. E. Walker, representing the Bureau of Animal Industry and the Extension Service of the Agricultural and Mechanical College cooperating, has been stationed at Fort Worth for the purpose of assisting those who purchase cattle at that point. Owing to the fact that health certificates are issued with every shipment of cattle to other States, it has been possible to ascertain the number of stockers and feeder cattle shipped out of Texas from the Fort Worth market. From time work began until October 15, these shipments were as follows: Alabama, 6619; Arkansas, 1132; Louisiana, 3963; Georgia, 1040; Mississippi, 1282; North Carolina, 1548; South Carolina, 273; Virginia, 233; Florida, 31; Tennessee, 117. Total, 16,238.

In beef cattle work splendid results were obtained in the distribution of drouth-stricken beef cattle, which would otherwise have been sacrificed on the stock yards market for slaughter purposes. More than 200,000 head of these cattle were removed to different places in Texas and other States. Two definite beef cattle projects were staged. The demonstration at Oakwood, Texas, consisted in the putting in of dipping vats, silos, and the replacing of scrub bulls with pure bred sires. This demonstration also included the introduction of pure-bred sires in the herd of 600 razor-back hogs, which had the range of the 22,000-acre

hog-proof pasture. The results were remarkable. The offsprings from the pure-bred Hereford bulls were appraised by the auditor and manager of this company as having a 40 per cent increased value over the calves from the scrub sires. The same authority rated the improved pig crop from pure-bred males, as having a 50 per cent greater value and the project has demonstrated the feasibility of improving range hogs by using pure-bred sires and by planning forage crops for the cold and dry season. The second beef cattle project was installed this year and has not gone far enough to show definite results.

Poultry Husbandry. Practically all the poultry extension work has been planned and carried out along lines that would help to win the war. A vigorous campaign was launched to cull out the poor layers. Demonstrations were given in forty different counties and 5000 birds were culled by personal supervision, while over 40,000 birds were culled indirectly. This meant a saving of at least 3,600,000 pounds of feed that would have been wasted, which represents a saving to the State of at least \$90,000.00. This fall a similar campaign was conducted in 50 counties and approximately 100 demonstrations were given which were responsible for culling out approximately 100,000 unprofitable hens, thus saving 9,000,000 pounds of feed, worth approximately \$270,000.00.

A rather elaborate and extensive campaign was conducted to encourage the fall hatching of chickens largely as a war measure. This campaign was no doubt directly responsible for the rearing of 500,000 fall hatched chickens in Texas. In the spring a very unique and original campaign was conducted to encourage back-lot poultry keeping. Live poultry displays were placed in the best stores in the following Texas cities: Houston, Dallas, Waco and Ft. Worth. By actual count in Fort Worth, it was found that as many as 3000 people per day stopped long enough to read the placards and posters. From statistics and other data it is found that this campaign was directly responsible for at least 2500 backyard flocks of poultry.

Every poultry demonstration farm conducted has been a money-making undertaking. Twenty-five thousand people were advised as to the best way to feed poultry for egg production. Educational work in ridding poultry of lice and mites was no doubt worth thousands of dollars to Texas poultry raisers. Ten poultry schools were also conducted, with a total attendance of 550 men and women, who received two days of intensive training along up-to-date lines of poultry keeping. The First Texas State Egg Show was held at Houston. In the spring a very active campaign for a greater production of infertile eggs was conducted. This work alone was worth several thousands of dollars and saved many thousands of dozens of eggs. Last fall the First Texas National Egg-Laying Contest was started, to run for one year, for the purpose of increasing the yearly egg-production of the Texas hens. Two hundred birds were trap-nested and will be returned to the breeders with official yearly egg records. Monthly reports of this contest were published. Over 1000 people make a personal request for this work. The Second Texas National Egg-Laying Contest will be conducted this year.

The Texas State Poultry Association started a year ago is today one of the strongest State poultry associations in the Union. The work of

organizing county poultry associations is still in progress. There is now a total of fifty-five, seventeen of which were organized this year.

Advice has been given to over 5000 poultry raisers during the year and over 100,000 poultry circulars have been distributed.

Swine Specialist. The drouth has caused a large reduction in the number of hogs produced in Texas as compared with the previous years. All kinds of feed were scarce, high-priced and hard to obtain. In a large part of the State grazing suitable for hogs could not be produced. The price of hogs on the market did not justify their production under Texas conditions on as large a scale as formerly; consequently, most producers reduce their operations.

Efforts have been made to show that no farm could afford to be without at least enough pigs to produce its own pork supply; that pigs of the improved type pay best; that a balanced ration is the most economical; that it pays to provide grazing crops for pigs, where possible; that it pays to keep pigs free from vermin and disease, and to keep them in clean, wholesome quarters.

In spite of the adverse conditions prevailing very definite results have been obtained, especially in connection with the demonstrations conducted on farms. Under normal conditions these demonstrations will result in a greater production of pork. Many farmers have been convinced that by using the proper type of hog and feeding him the proper feeds under proper conditions, with normal weather conditions prevailing, pork can be produced at a profit.

Demonstrations have been conducted on thirty-five farms in order to teach the best methods of hog production. These demonstrations were mainly conducted to show that pork can be produced more economically when the pigs are fed on properly mixed and balanced rations, grazing crops are provided, pigs maintained in sanitary quarters and kept free from parasites and diseases. A majority of these demonstrations were completed and meetings were held on the farms of surrounding neighbors, so that the lessons taught might be as useful as possible to the largest number of farmers.

In the swine extension work, the most notable results have come from assisting county agents in the securing of high class breeding stock which have been distributed among individual farmers and members of pig clubs. On account of the extended drouth the swine industry was threatened with serious disaster, but has been preserved by the distribution of some 3000 brood sows, practically all of which have gone in lots of one to three to individual farmers.

Sheep and Goats. In several counties demonstration flocks have been selected. The specialist is cooperating with the owners in handling them according to approved methods for educational purposes. Four demonstration flocks have been established and carried on in Grayson county; ten in Runnels county, and four in Bandera county. A successful lamb feeding demonstration was carried on at Florence, Texas, in Williamson county, where forty-five head of lambs were divided into three lots of fifteen each, and fed in such manner as to convince the farmers by the results that a supplement, such as bran or cottonseed meal which tends

to give variety and make a balanced ration, is essential in feeding animals for market.

There are some 500 members in the sheep club work, but practically all of these are either fattening a lamb or just beginning with one ewe lamb instead of four, as planned in the department outline for club work. However, the foundation for sheep club work in the State has been laid and the indications are that it will grow rapidly in the future.

Approximately 1000 head of breeding ewes have been located and selected for various men who are just beginning in sheep raising. Besides this, a great many others who have written to Extension Service have been put in touch with reliable men having breeding ewes for sale and have thus been aided in securing good ewes to make a start in the business.

The Sheep Specialist has been instrumental in the successful organization of thirteen sheep and goat breeders associations, while six county associations are now in process of organization and will be on a working basis before the spring of 1919. The objects of these associations and the principal work they are doing is, educational, along lines of feeding, breeding and management; cooperative marketing of lambs, fat sheep and breeding stock; cooperative marketing of wool and mohair; cooperative buying of breeding stock, and cooperative use of valuable rams; advancement of unity of breed type in the community and section; encouraging more exhibits of various classes of sheep and goats at fairs; to make an effort to secure an adequate State dog law and to cooperate in efforts to destroy predatory animals.

Over 650,000 pounds of wool were handled cooperatively in counties having these organizations. By figuring the returns of this wool at 48 cents, the average price offered by local dealers, and comparing it with the returns at 57 cents, which was the average actually received, it may be seen that approximately \$60,000.00 was saved to the sheep men in these associations by the sale of their wool. Approximately 100,000 pounds of mohair was handled through the organizations at an advance of 20 cents per pound over the price offered by local dealers.

Another phase of work which has been successfully carried out by the organizations is the fight against predatory animals. About fifteen counties are now offering through the local organization bounties of from five to twenty dollars on wolf scalps, and some are offering bounties on wild cats, etc.

Dairy Production.—Two men are employed in dairy production. One man particularly specializes along the line of feeding, record keeping, etc., and the other more especially on silos and stimulation of forage crops, and particularly the introduction of better grades of dairy cattle.

During the past two years more than 2500 head of Holsteins have been brought into the State from Wisconsin, Michigan and Ohio, as well as other Northern and Northwestern States, and most of them were selected by some member of the Extension Service in co-operation with farmers and bankers. The Service has also been instrumental in the distribution of 600 head of registered Jerseys and the redistribution of seven carloads of grade Jerseys among dairy farm demonstrators.

At a recent meeting of the business men and bankers in Waco, Texas, it was decided under the leadership of Mr. Woodson, President of the

Texas Bankers' Association, to secure a loan fund of \$100,000 for the purchase of dairy cattle and silos.

In the spring a campaign was undertaken to increase the interest in silos in this State. Definite results will not be obtainable until the county agents, reports are turned in at the first of the year, but they show an increase of approximately 600 silos during this season.

Arrangements have been made for holding twenty-five two-day special dairy schools during the coming season, and a bulletin on the proper feeding of dairy cattle has been published.

The first Farmers' Co-operative Cow Testing Association was organized in Tarrant county during September. There are eighteen herds, most of which are pure-bred cattle.

A special demonstration in dairy farm record keeping and herd management has been undertaken at the Prairie View Normal School for negroes. In this herd are about fifty head grade Jersey cows of various values.

A number of plans have been furnished for dairy barns and milk houses in the State and several have been built with the assistance of the field man.

There are several local dairy associations in the State through which the specialist works, such as Premont, Alice, Nacogdoches, Texarkana, Houston, Amarillo, Childress, Dallas, Cleburne, Liberty Hill, Florence, Iowa Colony, etc., and much permanent good has been accomplished.

Dairy Manufacture.—One man is employed on this line and devotes his time to the improvement of the quality of butter, ice cream, etc. Special work has been done with the Jim Wells County Creamery, Alice, Texas; Dairy Products Company, Kingsville, Texas; Hamilton Creamery, Hamilton, Texas; Falfurrias Creamery, Falfurrias, Texas. A good set of books are kept at the Alice Creamery, the plant is kept in a sanitary condition and a good quality of product has been turned out for which a price of from three to five cents has been received all the time above the market for Texas butter. The Dairy Products Company reported the latter part of last year that they were unable to make the quality of butter that they desired. After special efforts on the specialist's part in co-operation with the county agent the creamery manager reported a noted improvement in the quality of cream made and that he was experiencing no difficulty in making butter to satisfy the demands of the market. Efforts were made to build up the ice cream department. It was the manager's idea that 50 gallons a day was the plant's maximum capacity; however, by following the specialist's advice regarding several matters the output of the ice cream has averaged from 100 to 125 gallons a day all summer, and machinery would have been installed to more than have doubled this capacity had the plant been able to secure the necessary sugar for the increased output. A very high quality of cream has been produced and it is estimated that the creamery has made (through profit on additional ice cream and ice saving) approximately \$2000.00. At the same time more money has been paid to the producers for sweet milk and cream than would have been paid for the same material in the form of sour cream to be used in butter making. Work has been done at the Hamilton Creamery giving instruction in butter making, during which time the quality of the

butter was brought from a very low quality to a high quality, and in 1918 special attention was given to the ice cream question. It is a conservative estimate to say that the creamery has made from \$800.00 more during the season than would have been the case had they received no assistance. Several visits have been made to the Falfurrias Creamery in following up the milk condensing work which was started with them in 1917. By evaporating part of the water and furnishing the product to an ice cream plant in San Antonio about \$20.00 more a day is being made on 300 gallons of skim milk than would have been made by feeding the skim milk to hogs.

Visits have been made to fifteen creameries and advice has been given on important features of creamery work, but so far the opportunity of doing special work has not presented itself, although much progress has been made. Work was done with nine dairymen at Austin and fourteen at Waco, giving instructions in feeding problems. Every dairyman, with one exception, was underfeeding his cows for the milk production received and in many cases not even feeding a maintenance ration to milking cows. An idea of what may be accomplished along this line is indicated in the report of the county agent at Austin, in which he says that after receiving instructions in feeding, Mr. Eugene Hill followed out the suggestions and in a very few days had increased his milk flow fifteen gallons a day from sixty cows.

Soil and Farm Crops.—One agronomist is employed in seed selection, establishment of permanent pasture, irrigation, crop rotation, etc. The work consists chiefly in answering inquiries concerning soils, fertilizers and field crops; assisting county agents in these subjects and co-operating with county agents and farmers in conducting definite demonstrations in seed selections; establishment of permanent pastures, irrigation, crop rotation, soil improvement and the introduction of new plants. Considerable time has been given to lecture work, chiefly along the line of increased production and the adaptation of food and feed crops. Timely articles have been prepared in bulletin and circular letter form and distributed over the State, while a number of articles have been prepared for the agricultural press. One hundred and forty-seven definite demonstrations in co-operation with forty-seven county agents and 145 farmers were planned.

Special efforts have been made to encourage selection and much work was done with the grain sorghums. Eighty-three farmers and twenty-two county agents signed contracts to co-operate in this work. The unusual dry season caused many farmers to abandon the attempt to produce seed for planting purposes. In isolated localities where the rainfall was sufficient to fully mature the co-operating farmers will have more than 35,000 bushels of the several varieties of the grain sorghums for sale this fall. More than one hundred farmers have been instructed in the method of growing and selecting seed of the grain sorghums. Experienced farmers claim that fields of selected seed will increase the yield of grain sorghums at least 5 per cent. Taking this estimate, the same land which produced the 35,000 bushels of seed would have produced only 33,333 bushels had the usual quality of seed been planted. This, at \$4.00 per hundred, effected a saving in yield alone of \$3,324.00.

The 35,000 bushels should be worth \$10,840.00 additional for seed purposes alone, which would show a total gain of \$14,164.00 on this series of demonstrations. Work was also done in the selecting of seed for peanuts and corn, the establishment of permanent pastures, rotation and soil improvement, irrigation, introduction of new plants, forage and silage crops, etc., the details of which will be found in the annual reports for the two years included in this biennium.

Government Distribution of Seed.—Much of the State was so severely affected with drouth in 1917 that seed suitable for planting was not matured. It was deemed advisable for the government to take over the distribution of seed in this State. A sum of money was appropriated by the United States Department of Agriculture for purchasing seed to be sold at cost to farmers in the drouth-stricken portions of the State. This work has been in charge of a special agent, who was employed by the Extension Service for the purpose of improving seed corn by field selection. As his time has been almost entirely taken up by the distribution of feed the past year and the corn plats were ruined by the drouth, his report, which is on file in this office, gives detailed information regarding the seed distribution from which the following totals are given: Total amount from farmers on seed sold at cost, \$342,069.83; amount saved to farmers on seeds sold at cost, \$180,340.43. Number of acres planted in each variety of seed purchased: Cane, 29,746 acres; milo, 76,822 acres; kaffir, 26,344 acres; feterita, 31,177 acres; Sudan, 4,115 acres; peanuts, 5,773 acres; cotton, 126,640 acres, and corn, 128,000 acres. Total, 428,617 acres.

Farm Engineering.—One specialist is employed in giving demonstrations in terracing, irrigating and draining. The major portion of his time has been devoted to terracing. There are many more calls from county agents than it is possible for the terracing specialist to comply with. For a few months in the spring a special emergency agent was employed to assist in giving demonstrations in terracing. There were 68 terracing demonstrations; 394 lines were located; 1,434 acres were terraced and there was a total attendance of 843. There were 10 soil improvement and 298 terracing projects. Inspected field with view of terracing and gave advice as to how to proceed in terracing on 19 farms. Inspected and gave advice on eight terraced farms where demonstrations had been previously conducted. Inspected and gave advice on 29 farms with a total of 283 acres which had been terraced by the farmer or county agent. Assisted in drainage of thirteen farms. Visited and inspected 28 irrigated plants. Advised six men regarding small dams for impounding water to irrigate with. Made 18 topographical surveys and maps for irrigation projects. Assisted in locating ditches, rows, flumes, plants, etc., on 18 farms which are under irrigation. Inspected 20 farms to determine whether or not it was advisable to put fields under irrigation. This work has consisted principally of advising and assisting the county agents. There are 150 agents with terracing, irrigation and drainage problems, and the specialist has assisted many agents in adjusting their levels. This has been quite a problem with some of the agents and is an important item to look after.

Plant Diseases.—One specialist is employed in giving demonstrations in the control of plant diseases. Owing to the extreme drouth of the past two years, plant diseases have not been as severe as is usually the case. The work of the Pathologist during the past year has been of a more definite character than during previous periods, due to the introduction of clearer ideas in respect to project work. The work on boll rot control, carried on at selected points during the season of 1917, gave definite results through the sale of the crop about the opening date of this report. A good sample case which will illustrate the value of the work will be found at Wills Point, where, with three growers, demonstrations were introduced in seed treatment for boll rot. Through a better turnout at the gin, better condition of staple in the bale, and gain due to absence of ruined bolls in the field, the growers concerned estimated that the demonstration had added between \$2500 and \$3000 to the income for their combined crops. Mr. R. M. Womack of Wills Point, who treated his seed with formalin, was able to contract his entire crop for planting purposes at an advance of 50 per cent a bushel before any had been picked, and the absence of stained and torn locks in his baled cotton gave it a grade higher on the market than cotton from adjacent farms. The smut control demonstrations were seriously handicapped in many counties by the drouth. The success of the treatment was evident, quite clearly, however, as in the more favored regions.

Fruit Growing.—Beginning with the fiscal year of July 1, 1918, a Horticulturist was employed, but early in the fall he was granted a leave of absence so that he could enter the army; therefore, the horticultural activities are included in the joint report of the State Leader of Specialists and the Vegetable Specialist, which is on file in the office. However, a slight idea of the value of this work to the State may be gleaned by giving a few results from this report. Fifteen counties reported on pruning demonstrations and 26,075 trees were pruned as the direct result of the demonstrations. The average returns of an uncared for and an unpruned tree is one-fourth bushel per tree. The average returns from a pruned tree is one bushel per tree. On the average unpruned tree less than 50 per cent is marketable. On the average tree that is pruned, but not sprayed, 60 to 70 per cent of the fruit is marketable, owing to its large size. However, taking 50 per cent as the amount marketable, and considering the average price received per bushel for this class of fruit, it is estimated that \$15,644.80 was gained by pruning alone. Nine counties reported on spraying demonstrations and the number of trees sprayed as a result of the demonstrations was 17,675. The average sprayed orchard yields 98 per cent marketable fruit. The average unsprayed orchard does not yield more than 50 per cent marketable fruit. Assuming that the orchard pruned and sprayed yields no more than the orchard that is pruned only, that is, one bushel per tree, it is estimated that the amount gained by spraying these trees is approximately \$13,575.20. While these figures are estimates, they are based on average results of demonstration orchards and can be taken as a criterion of what may be expected from properly cared for orchards in the best orchard sections of the State. Special interest has been taken in this phase of the

work by the county agent in Henderson county, and for this reason we have spent more than the usual amount of time with him. The results began two years ago have been uniformly successful, not only in pruning and spraying, but particularly in marketing. As a result of these demonstrations a marketing association has been formed and the county agent estimates that the farmers saved \$20,000 the past season.

Vegetable Growing.—One specialist is employed in vegetable growing, devoting his time especially to the establishment of home gardens in sections of the State where it is believed that gardens are not profitable, particularly in the black lands. These demonstrations have been very successful, as is shown in a detailed report of his activities, which is on file in the office, from which the following results are culled: Demonstration work was carried on in twenty-four counties during the past year. Fifteen of these counties and eighteen additional counties have made requests for this work next year. The season for garden work in Texas has been very dry for the past two years; however, the demonstration gardens generally proved a success, the owners making from \$15 to \$125. One demonstrator in Orange county had one of the best gardens in Texas. The demonstration work in school gardens was done mostly with colleges. Four demonstrations were established at four colleges and these gardens furnished most of the vegetables used by the colleges concerned. The garden at the Texas Christian University, Fort Worth, saved the college over \$200. Several small school gardens were started this year, but failed on account of the drouth, and a number of sawmill gardens were planted in the eastern part of the State, where the sawmill owners are trying to help the employes as much as possible in raising their own food. One firm has given each man a garden plat and prepares the land for planting and employs a hired gardener, who advises the people how to garden. There is not as much irrigation in Texas as there should be. There are seven of the vegetable demonstrators who irrigate and the garden of one demonstrator who irrigated his garden up to July 1st brought in \$240. Most of the money was made off of fall and summer tomatoes. Much work was done with sweet potatoes, hot beds and cold frames, insects and diseases, which was worth thousands of dollars to Texas gardeners.

Insect Control.—Until this fall the work of the Extension Entomologist has been of a somewhat general character, owing to the fact that under the Emergency Food Stimulation Act three entomologists—one each on insects affecting truck crops, insects affecting field crops and insects affecting deciduous fruits—are established in this State, cooperating with the Extension Service. For some time the Extension Service has been receiving urgent requests for assistance in bee culture, Texas being one of, if not, the largest honey-producing States in the Union. Since establishing this work the Extension Entomologist's time has been employed almost entirely in giving demonstrations in proper management of bees. So popular is this work that it will probably be advisable, even when the government's entomologists are withdrawn, should such be the case, that a man be employed as bee special-

ist. Owing to the fact that different entomologists have been employed during the past biennium, while a number of U. S. D. A. entomologists have worked in cooperation with the Service, it will be impossible to give details of their work here.

Nut Culture.—One man is employed in giving demonstrations in the planting of pecan groves and particularly in top-working native pecan trees. The work has been uniformly successful and there is an increased demand for the services of such a specialist. The work at this time embraces four distinct features: (1) Planting pecan nuts to grow seedling trees with the object of ultimately budding or grafting to improved varieties; (2) transplanting groves of budded or grafted trees; (3) budding and grafting of the countless number of native wild trees; (4) control of insects injuriously affecting the nuts. The most immediate urgent need comes under the third head. Demonstrations have been established in thirty-nine counties; ninety-six demonstrations have been held with a total attendance of 961. In addition to budding and grafting the native growth of the State much has been done toward transplanting nursery trees. Possibly the greatest service that has been rendered to the pecan industry through the Extension Service,—and perhaps the greatest that could have been rendered,—has been along the line of directing the attention of the public to Texas varieties and away from the coast kind. The necessity of using adapted varieties has been so constantly and persistently urged that many of the nurserymen of the State have been forced to largely abandon the growth of the coast kinds, and to take up the growing of western ones. As an illustration of how effective the efforts along this line have been it is sufficient to state that only a small part of the demand for Texas varieties could be met by the nurserymen last year while thousands of trees of coast kinds stood in the nurseries unsold. Next in importance to the subject of varieties comes the matter of improvement in methods of budding and grafting. Probably the most important discovery ever made in connection with budding and grafting pecan trees was made by the Extension Service, which was the fact that patch budding can be done on large limbs, with a higher percentage of success, by paring the bark of the stock thick. This method obviates all the other objections and at the same time secures a higher percentage than any other method. It is confidently believed that this discovery alone is worth many times the amount of money spent by the service in promoting the development of the pecan industry. Many other phases of the work are given in the annual reports on file in the office showing the monetary value of the pecan work being done. However, attention should be called to the necessary difference between a report concerning pecan work and a report that deals with an annual plant. The former cannot give such definite results because the efforts have not come into fruition.

Farm Management.—One man has been employed all of the time and another part of his time, in taking surveys of typical farms, digesting these reports and deciding on their particular application. While it is stated that one man is employed on this work, it is not possible to take these surveys at all times of the year, and his time has been

partially employed in the solving of general farm and economic problems. The other man's time this fall has been largely employed in sweet potato house constructions. The bulletin entitled "The Diversified Farm," was revised and a chapter of feed production added. The revised bulletin just issued is entitled "Man Power in Agriculture." It analyzes the fundamental principles of diversified farming, and demonstrates that diversified farming is superior to other farming, both from a standpoint of money returns and the production of food. A cost of cotton survey is being made in cooperation with thirty-five county agents. Schedules have been prepared and mailed to these agents, asking them to return reports from twenty-five farms each. Thirty-one sets of farm accounts have been mailed to farmers. Four weeks were spent with a party on an automobile trip through West Texas for the purpose of studying the farm and ranch management problems and their adaptation to recurring drouths, and also for the purpose of studying the question of immediate drouth relief.

Sweet Potato Houses.—One regular man with part-time assistance of another has been working on the construction and management of sweet potato houses. The yield of sweet potatoes has not been nearly so large as in the past. This is caused by a number of factors, among the most important being the extremely cold weather of last season freezing seed potatoes and the fact that there was a very limited supply available for seed. Second, the extreme drouth of this season has materially curtailed the yield. Third, the farmers are receiving from two to three times as much as they usually receive at digging time and are reluctant to take any chances on storing. Under these conditions special emphasis is being placed on storing a sufficient quantity for seed for another year.

Cotton Grading and Marketing.—In practically all markets in Texas cotton is bought on grade alone, and no attention is given to staple, notwithstanding the fact that staple more than grade fixes its value. As a demonstration of what could be accomplished by the production of good staple cotton and marketing it through cooperating groups of farmers, representatives of our staff joined with the representatives of the United States Bureau of Markets in assisting groups of farmers in Smith, Dallas and Anderson counties in marketing small lots of cotton. The price received varied from $1\frac{1}{4}$ to 8 cents above the price offered in local markets, the increase representing the premium now being offered in local markets for good staple cotton. During the months of November and December, 1917, and January, February and March, 1918, the field leaders of this project, cooperating with the county agents, held meetings of farmers in the counties of Smith, Cherokee, Anderson, Rusk, Panola, Shelby, San Augustine, Jasper, Sabine, Dallas, Bell, Williamson, Brazos and Burleson for the purpose of inducing farmers to purchase and plant cotton seed of approved varieties and interesting them in cotton classing and marketing work to be conducted later in the season. We advocated the planting of varieties which would produce a staple of one and one-sixteenth to one and one-eighth inches because of the increased demand for cotton of this length,

and urged the adoption of one variety for a community in order to avoid cross polination and mixing at the gins and to insure the production of a large volume of cotton of uniform staple of good character. The direct result of our campaign to stimulate the production of a better staple cotton was the purchase through our assistance of between 28,000 and 30,000 bushels of Lone Star seed in the counties mentioned and the further purchase of large quantities of Lone Star, Rowden, and other staple varieties obtained from dealers in small lots, of which no report was made to us. Offices were opened and representatives of the Extension Service and United States Bureau of Markets were stationed at fourteen important towns in the cotton section for the purpose of giving assistance in grading and stapling the cotton. Up to and including October 25th, these offices have received and classed 31,298 bales of cotton. Complete details are unavailable at this time because much of the cotton graded has not been sold, but aggregating results shown in the annual report on file in this office a total of \$474,270 may be given as the tangible gains to farmers to date in three of the counties where we have offices, and such being the case it is safe to say that when all returns are in that they will show an aggregate of at least \$1,000,000 added to the income of Texas farmers through the premiums received from the sale of this year's cotton. This sum, however, does not represent the value of increased yield from the better seed planted, the higher value of cotton seed sold for planting purposes, the higher prices received because of correct grading of short cotton, nor the benefits that will result from substituting good varieties for inferior varieties and the steady advance toward State-wide recognition in the value of staple in buying cotton. As a direct result of our work this season, we estimate that not less than 300,000 bushels of pure Lone Star, Rowden and Acala cotton seed will be planted in Texas next year. This estimate is based on letters of inquiry from farmers, reports of county demonstration agents and seed dealers. This will mean that not less than 900,000 acres of land will be planted to good seed and with a normal yield it will mean an increase of 300,000 bales in the production of good staple cotton in the State. If the increased value of a bale of good staple cotton over a bale of extremely short staple is reckoned at only \$5.00, this will mean an addition of \$1,500,000 to the value of next year's cotton as a result of this single phase of our work this year.

Syrup Standardization and Making.—Two men have been employed part time in the standardization of syrup and the stimulation of planting sugar cane and saccharine sorghum. Attention has been directed to devising better methods of making syrup on the farm; to processes of standardization and marketing, and to increasing production by procuring supplies of seed sugar cane and pure saccharine sorghums. During the 1917 season we cooperated with the Bureau of Chemistry of the United States Department of Agriculture, represented by Dr. J. K. Dale, syrup technologist, in making a demonstration in Jasper county of the feasibility of blending sugar cane syrup made on many farms into a uniform product of high quality. The demonstration was successful and there is no longer any doubt that with an investment of

not exceeding \$600 a group of farmers can, at an expense of not exceeding 3 cents a gallon, convert large quantities of syrup of varying appearance, quality and flavor in a standard product of uniform quality, which will command a ready sale in the market. Plans for the present season contemplated a limited number of demonstrations of improved methods of farm manufacture of sugar cane syrup. These demonstrations are being attended by county agents in adjacent counties, and in a few instances the methods are demonstrated by the county agents in their respective counties. The syrup making season is just beginning and we are not able to report definite results, but a general outline of the work as conducted up to the present time is on file in the office in the annual report for the present biennium.

Community Cannerys.—The time of two men and one woman has been partially employed in the organization and management of community canners. This work has been generally successful this season. Several groups of farmers were organized into farm credit associations in Smith county by the Extension Service. Men and women in four communities interested in purchasing equipment large enough to can the foods for each neighborhood. Red Springs, Wood Springs, New Harmony and Union Point were the four cooperative canning associations. These communities combined their orders and got a cash discount on the steam canning machine and a carload of cans (60,000). A local bank was glad to carry their joint notes. Each association selected a man in the community to act as manager and operator, and these men were drilled in preparing, packing, sealing and processing or sterilizing. At the close of the canning season every household belonging to these associations had from 100 to 700 cans of good quality canned goods for the winter diet. The plants had been operated on a toll basis. The members of the association who brought vegetables gave one-half of the finished product for the cans and the other costs of canning. This toll was set aside to be sold by the managers. Forty thousand cans were filled with surplus food from the home gardens and truck patches of these communities. Previously this had been a total loss. At an average price of \$1.50 a dozen cans these goods were worth \$5000, or more than enough to cover the cost of all cans bought, as well as the equipment and building, also the time of the managers at 15 cents an hour and small incidental expenses of operation. The Director urged an extension to other counties of this very successful experiment. Applications came from county agricultural agents for assistance in establishing these projects in their counties faster than they could be answered. Seventy-seven plants were established; total investment in equipment and cans, \$90,539.20; total value of products canned, \$166,992. Calls for help from county and home demonstration agents caused the service to see that the problem of supervision could be handled only by having a model plant where the specialists could demonstrate installation of equipment and plant management. Dr. Bizzell, President of the College, made it possible to have a simple, but well arranged plant where short courses are held from time to time for county workers and managers of canners. This demonstration plant is located on the

campus of the Agricultural and Mechanical College and a three days' canning school was held during the Farmers' Congress, at which a class of fifteen was trained in the principles of canning and the handling of such a canning plant. Requests have already come in for this service next year from twenty-three new counties with a total of fifty-nine new plants. Other requests are coming in through the district agents, and in the spring it is very likely that it will be necessary to limit counties to the facilities for handling them.

Car Lot Buying and Selling.—For the greater part of the year one market specialist has been stationed at Fort Worth, cooperating with the Bureau of Markets in putting farmers and county agents in touch with dealers offering feed in car lots. This work has been especially necessary in drouth stricken portions of the State. During the operation of the emergency office, that is, from December 10, 1917, to June 1, 1918, also from August 4, 1918, to October 15, 1918, orders for 1173 cars of feed were transmitted. Of these about 50 per cent were received direct from growers and farmers cooperating with county agents, about 30 per cent from banks, and about 20 per cent from individuals. As an illustration of the monetary value of this service a quotation is taken from the report of Assistant Emergency District Agent Walter E. Davis, which reads as follows: "The saving to our farmers ran from \$30 to \$200 a car, or about an average of \$75 a car. A saving of \$75 on 1173 cars would give a grand total of \$87,975 saved to Texas farmers through this work, a very small per cent of which would more than compensate for all expense involved. In addition, information was furnished county agents, farmers or organizations, bankers and feeders, through the publication—three times each week—of approximately 2000 market bulletins. The information contained in these bulletins, it is believed, enabled them to secure more advantageously their requirements of grain, hay and feedstuffs." Full particulars regarding the advantages of this work are on file in this office.

The outlines previously given are only sketches from results given in annual reports which are on file in the office of the Extension Service, contain statistics and full details of results obtained too voluminous to find place in this report.

FARM DEMONSTRATION WORK.

It is impossible to make a report in September and give the correct figures in Farm Demonstration Work and Home Demonstration Work. These projects are conducted for the entire season and the results cannot be secured until the final report is submitted at the first of each year. This data is gathered and reported by the County Agents and Home Demonstration Agents and submitted to the District Agents and then to the Director on forms which have been in use for some time previous to the inauguration of the Extension Service in co-operation with the College, and it will be necessary to revise this reporting system in order to get even any accurate data up to September, which would either require two sets of report forms or an abolition of the forms used for years by the United States Department of Agriculture.

However, in so far as it is possible to judge, the increase in this work shows a very satisfactory ratio of increase, and for the sake of giving a clearer insight to the magnitude of this work quotation is made from our last annual report published at the beginning of the year 1918:

COUNTY AGENTS.

We feel that the tabulated results given herewith denote marked progress in County Demonstration Work. Under the heads of corn, cotton, small grains, legumes, hay and forage crops we had 5169 demonstrations and 3063 reported on their work. The drouth in certain sections of the State completely destroyed many of the demonstration crops, while the call of Agents to the service of the county interfered with the demonstrations under their care and supervision. However, in the face of all adverse conditions a careful compilation of the records reveals the following conditions:

Effect of Demonstration Work on Community.—15,275 farmers are raising practically all of their home supplies; 6932 have opened new bank accounts; 4949 have increased their bank deposits; 7351 own their farms; 3057 have paid off their mortgages and 4733 are trading on a cash basis since demonstration work began; in fact, 72½ per cent of the demonstrators and co-operators have decreased their indebtedness along various lines, while 72 2-7 per cent of farmers in demonstration territory are showing increased interest in agricultural meetings and 72 1-7 per cent are showing a desire to study their farm business and progress; 1546 labor-saving devices for the home have been installed among the demonstrators and co-operators.

Farm and Farmstead Improvements.—452 buildings were erected; 901 buildings improved, 279 building plans furnished, 851 buildings painted or whitewashed, 284 water systems installed, 264 lighting systems installed, 1610 home grounds improved, 1691 farm and home sanitary conditions improved, 3694 homes screened against flies and mosquitoes, 699 fly traps installed, 1220 sanitary privies erected, 116 telephones installed, 683 farmers furnished plans and induced to adopt a system of rotation with a total of 45,783 acres in such rotation; 800 new pastures were established, 438 old pastures were renovated with a total of 10,541; 615 drainage systems were installed, 818 farmers were induced to drain all or part of their farm, 1041 were drained by tile and 56,459 by ditch; 1343 farmers were induced to move stumps covering 18,574 acres; 3701 farmers were induced to terrace their sloping land, totaling 130,930 acres; 28,424 home gardens were planted; 116,718 farmers were induced to save surplus products for winter use; 1026 farmers planted cover crops to be turned under, and 13,706 new implements and tools were bought.

Kind of Crop	No. Demon- strators.	No. report- ing.	Total average.	Average Yield Per Acre	Increased Yield Per Acre	Total In- creased Yield Per Acre	Price Per Bushel or Pound	Total Value Increased Yield	No. co-op- erators.	Total acre- age co-op- erators.	A. Treated for Dis- eases. Insects.	Remarks.
Maize.....	86	62	186	84 Bu	16 Bu	2972 Bu	\$ 1 50	4,464 00	85	1491		
Feterita.....	21	21	366	72 Bu	17 Bu	9222 Bu	1 40	12,910 00	190	516		
Kafir.....	62	36	2490	26 Bu	14 Bu	226954 Bu	1 40	317,735 60	8323	26749	320	
Corn.....	1767	1017	16211									
Cotton.....	988	608	17605	813 lbs	305 lbs	5369525 Lbs	17	375,866 75	8073	40637	31902	Seed Cotton
Oats.....	285	184	9465	28 Bu	16 Bu	151440 Bu	70	106,008 00	499	3144	27	
Wheat.....	281	180	9118	23 Bu	13 Bu	24934 Bu	2 00	49,868 00	499	12090	1000	
Barley.....	27	14	293	38 Bu	7 1-2 Bu	4378 1/2 Bu	1 50	6,581 25	11	160		Small Grain
Rice.....	15	7	3004	77 Bu	23 Bu	69092 Bu	2 50	172,730 00	1	600		
Rye.....	42	27	151	32 Bu	17 1-2 Bu	2415 Bu	1 50	3,622 50				
Alfalfa.....	54	22	804	3 Ton	1 Ton	804 Ton	34 00	27,336 00	57	797		
Cane (hay).....	81	30	487	2 4-5 Ton	1 1-2 Ton	730 Ton	30 00	21,900 00	343	1993		
Sorghum.....	78	52	3018	3 1-4 Ton	1 3-4 Ton	5281 Ton	30 00	158,430 00	53	426		
Sudan Grass.....	140	85	2250	3 1-2 Ton	1 1-4 Ton	3428 Ton	32 00	109,696 00	345	5524		
Med. and Pasture.....	13	11	61	2 1-4 Ton	1 1-2 Ton	30 1-2 Ton	32 00	960 16	11	63		Hay, Forage or Clover.
Millet.....	17	5	292	3 1-2 Ton	1 Ton	292 Ton	30 00	8,760 00	10	20		
Clover.....	88	41	90	1 Ton								
Soy Beans.....	135	102	1569	21 1-4 Bu	5 Bu	7840 Bu	4 00	31,360 00	645	6705		Seed Bushels Cured Hay
Peanuts.....	494	291	6354	1 2-3 Ton	1-2 Ton	784 Ton	26 00	20,384 00				Seed Bushel
Cow Peas.....	321	177	7421	24 3-4 Bu	7 3-4 Bu	49243 Bu	1 50	73,864 50	1496	12596		Cured Hay
Field Peas.....	39	39	10027	1 2-3 Ton	1 Ton	6354 Ton	36 00	288,744 00				Seed Bushel
				18 1-5 Bu	10 1-2 Bu	76065 Bu	2 50	190,162 50	1238	8192		Cured Hay
				2 1-4 Ton	1 Ton	7421 Ton	30 00	222,630 00	200			Seed Bushel
				8 3-5 Bu	2 Bu	20054 Bu	2 50	50,135 00				Seed Bushel
Velvet Beans.....	107	42	458	15 1-3 Bu					202	1165		
Mexican Beans.....	18	6	250	12 Bu								
Spanish Peanut.....	12	7	125	29 1-2 Bu								
Total.....			84894					\$ 2,254,149 06	22283	122634	33249	

Total Value Increased Crop Yield

\$ 2,254,149 00

Poultry—1094 farmers were induced to produce infertile eggs, and received an average of 35c per dozen, which records show to be 7 cents per dozen more than was received for ordinary eggs. Total products 315,165 dozen.

Total increase.

\$ 2,254,149 00

Saving on fertilizer bought cooperatively.....

22,061 55

Farm Manure—148,290 tons estimated at 50c a ton.....

3,872 00

Blue prizes won by members boys and girls' clubs from fair, etc.....

74,145 00

Farm products bought or sold through influence of Demonstration Agent work at approximate saving to farmer of.....

6,180 00

84,492 50

\$ 2,444,900 11

The preceding figures clearly reveal the advantages of demonstration methods more forcibly than could possibly be the case under normal conditions, for while the drouth has necessarily decreased the average yield over the State, yet the demonstration yields have been so nearly normal as to show an unprecedented increase under the circumstances and this increase figured at actual market prices reveals an income to the taxpayers of Texas of over \$2,444,900.11, produced by demonstration methods which would not have been received had the land been cultivated under ordinary methods. However, this is only a small portion of the benefits accruing to farmers through demonstration methods. There were 22,283 co-operators, who cultivated 122,634 acres, but their increase cannot be shown, as they are not required to keep complete records. Furthermore, there were various activities carried on, the results of which cannot be averaged or shown in figures without going more into detail than this naturally limited report will permit. However, we shall endeavor to mention a number of them.

Corn (including kaffir, milo and feterita).—11,303 farmers were influenced to select seed for next year's crop, and 78,516 bushels of seed were selected, while 1322 fall-plowed their demonstration acres; 573 turned under cover crops; 3338 harvested for silage, and 4312 farmers were influenced to use better methods.

Cotton.—756 farmers planted pure or selected seed and 1692 were induced to field-select seed for next year's crop; 773 fall-plowed their demonstration acres, and 102 turned under cover crops; while 11,676 farmers have been influenced to use better methods.

Small Grain.—14,565 acres were threshed for grain; 2227 acres were cut for hay; 12,178 acres were grazed off at an estimated value per acre of \$10.00; 376 acres were turned under for soil improvement, while many farmers were induced to sow these crops for the first time.

Hay, Forage or Cover Crops.—823 acres were grazed off at an estimated value of \$14.20 an acre; 212 acres of soil in this class of crops were inoculated, while many farmers ordered material for inoculation through County Agents; 456 acres were turned under for soil improvement.

Summer Legumes (Cowpeas, Soy Beans, Velvet Beans, Peanuts, etc.).—12,734 acres were threshed for seed, and 10,728 cut for hay; 27,250 acres were grazed off at an estimated average value for grazing of \$25.23 an acre; 7289 acres were turned under for soil improvement; 1249 acres were inoculated (181 by Department cultures and 1068 by inoculated soils); 178,515 acres were planted to these crops due to the influence of the County Demonstration Agents.

Potatoes (Sweet Potatoes).—There were 273 demonstrators, 112 reporting with a total acreage of 1244, yielding an average of 276 $\frac{2}{3}$ bushels per acre; 400 acres were treated for diseases, insects and pests, while 2574 acres were worked by improved methods, and there was a 13,025 acreage increase in this crop due to the advice of the Agents. *Irish Potatoes*.—There were 40 demonstrators, 29 reporting with a total acreage of 1544, yielding an average of 159 bushels to the acre; 1362 acres

were treated for disease, insects and pests, while 789 acres were worked by improved methods, and there was 1410 acreage increase due to the Agent's work.

Orchards.—There were 208 demonstration home orchards containing 32,833 trees, distributed as follows: Peach, 132; apple, 54, pecans, 6; citrus, 6; plums, 5; pears, 3, and grapes, 2. 840 orchards were inspected, containing 91,054 trees; 671 orchards were pruned containing 60,538 trees; 592 orchards were sprayed containing 23,784 trees; 240 orchards were wormed containing 31,444 trees, and 233 orchards were planted, containing 12,583. All of the above were due to the Agents' influence and advice, while they assisted in caring for 105 orchards and actually sprayed 13,585 trees, pruned 19,006 trees and wormed 501 trees. It is difficult to estimate or give a correct idea of the value of the above work.

Live Stock (Horses).—36 pure-blood stallions, 30 pure-blood jacks and 274 brood mares were introduced in different sections, due to the Agent's influence; 47 demonstrations in feeding horses and 115 in feeding mules were given, and 2335 horses and mules were cared for according to methods recommended.

Dairy Cattle.—292 pure-bred bulls and 1789 bred cows or heifers and 2477 grade dairy cows were brought into the different sections due to the Agent's influence, while 3785 were tested to determine the profitable milk producers; 2492 farmers were induced to feed a better balanced ration and 17,414 head of stock were so fed; 196 demonstrations in dairy work were supervised with 3568 cows in the demonstrations; 2 creameries and 32 cream routes were established due to the Agent's influence; 8 cow-testing associations and 44 dairy breeders' associations were established.

Beef Cattle.—284 bulls, 2066 cows and 4149 grade cows of the pure-blood beef cattle type were placed in various sections of the State; 106 beef-breeding herds were started, while 12,520 head of feeding cattle were brought in; 35 feeding demonstrations were given, with a total of 7389 cattle in the demonstrations; 2997 head of beef cattle were cared for entirely by methods recommended, while 10,793 were cared for partially by these methods; 7 cattle breeders' associations or clubs were formed with a membership of 239.

Dipping Vats.—522 dipping vats were built through Agent's influence; they helped to construct 279 and helped to fill 628 with the solution, while the solution was tested for 755; 800 were built in the counties represented by Agents; 925,602 were dipped during the year.

Hogs.—4694 head of pure-bred hogs—559 pure-bred boars and 4035 pure-blood sows or gilts—were distributed through the influence of County Agents; 1520 herds were started; 298 feeding demonstrations were supervised with a total of 7313 hogs; 1644 farmers were induced to start the growing of grazing crops for hogs, while 26,399 head of hogs were cared for according to demonstration methods.

Sheep.—82 pure-bred rams and 309 pure-bred ewes were distributed through the Agent's influence, while 2517 grade ewes have been introduced; 140 flocks have been started and 18 farmers have been induced to grow grazing crops for sheep.

Poultry.—120 poultry demonstrations have been held; 17,841 chickens, 1310 turkeys, 40 ducks and 28 geese have been grown and cared for according to demonstration methods; 1724 farms, containing 157,487 birds, have improved poultry management methods as a result of demonstration work; 1094 farmers have been induced to produce non-fertile eggs, and 3,781,978 eggs were produced, bringing an average price to the farmer of 35 cents a dozen; 18 communities are raising the same kind of poultry.

Live Stock Diseases and Pests.—Demonstration Agents and other Extension workers have induced the farmers to have the following number of cattle treated for diseases and pests: Blackleg, 82,619; ticks, 186,630; lice, 6938; hogs treated for cholera in co-operation with Dr. Frank R. Jones, Inspector in Charge, United States Bureau of Animal Industry (single treatment, 30,121; simultaneous treatment, 20,716). Hogs treated for worms, 4869; lice, 6938; mange, 16,870. Sheep for worms, 55; scab, 325; ticks, 1168. Horses—Distemper, 223; accidents, 29; other troubles, 108. The County Demonstration Agent administered serum for the prevention of hog cholera to 13,288 hogs, and the following number of live stock were treated as demonstration. Cattle for blackleg, 32,746.

Fertilizers.—4613 farmers were advised regarding use of fertilizers; 283 fertilizer demonstrations are being conducted with the County Agent; 4280 tons of fertilizer were used in these demonstrations; 40 communities were induced to buy fertilizer co-operatively, and 2813 tons were bought, valued at \$33,178 at a saving to the farmers of \$3872.00; 2128 farmers were induced to home-mix fertilizer on Agent's advice at an estimated saving of \$3.66 a ton, while 197 farmers top-dressed their crops with fertilizer at the suggestion of the agent.

Manure.—3797 farmers have been induced to take better care of farm manure; 397 have provided manure sheds; 798 are composting farm manure and waste products. There are 462 manure spreaders in demonstration territory, and the Agents have helped to place 183; 846 farmers are using phosphate or other material for reinforcing farm manure; 148,290 tons of farm manure are now being saved, due to County Agent's advice.

Silos.—861 silos have been built as result of County Agent's advice.

Organization.—The County Agents have assisted in organizing 479 farmers' clubs with a total membership of 19,729. Farm products have been bought and sold through these organizations with an approximate saving to the farmers of \$84,492.50.

Miscellaneous Demonstration Work.—During the year Agents made 94,630 visits to demonstrators, co-operators, other farmers, business men, boys and girls' club members, traveling 650,035 miles by rail,

team and otherwise. Persons interested made 57,297 calls on the Agent at their office or home, and 33,464 telephone calls; 5041 farmers' meetings were held under the auspices of the Agent or Extension Service representative, with a total attendance of 441,109, while the Agent addressed 5771 meetings; 1528 field meetings were held, with a total attendance of 17,770; 46,560 official letters were written by the agents and 3918 articles relating to the work were prepared, while 141,507 circular letters were sent out; 80,237 United States Department of Agriculture bulletins or circulars were distributed, and 73,543 State College or State Department of Agriculture; 574 farmers are keeping cost records, and 4008 partial cost records at the suggestion of the Agents; 185,000 are practicing fall plowing; 10,799 are selecting seed; 2593 are growing improved seed for sale; 2927 farmers are growing sugar cane or sorghum through Agent's influence.

HOME DEMONSTRATION AND CANNING CLUB WORK.

The Home Demonstration work, in spite of adverse conditions, has shown gratifying results. The work is divided into three branches, namely: Canning Clubs, Poultry Clubs and Household Demonstration. The total enrollment of these clubs this year was 6593, as compared with 4575 last year. The improvement in quality is exhibited by the detailed reports of each county home demonstration agent, the records of each club being on file in the office. Much of the improvements shown is due to the efforts of the district agents and especially the assistant State agent, who was in charge of the State work for several months after the resignation of the former State agent, and who relieved the State agent of much visiting, giving the State agent opportunity to devote more time to the county agents.

Home Demonstration Work.—1725 women were enrolled, 1112 doing active work. There are 152 organized clubs, 80 holding regular meetings; 550 fruit and vegetable demonstrations were given in homes and meetings with a total attendance of 1825; 4 rest rooms were established; 585,824 containers of products were put up by demonstrators, valued at \$83,853.30; 19,213 pounds dried vegetables were stored, valued at \$2,-202.00; 112,880 pounds of dried fruit were stored, valued at \$2120.00; 4505 gallons of brined vegetables were stored, valued at \$4142.00; 146 women made winter gardens; 93 butter making devices were made; 339 butter making devices were bought; 8587 pounds of butter were made, bringing an advance in price of 22 2-10 per cent; and 160 homes were induced to make new breads. Total value of products put up and stored, \$92,317.30.

Emergency Food Conservation Work.—65,084 women and girls were influenced by Home Demonstration agents' instructions; 1,036,467 containers of fruit and vegetables were packed, valued at \$248,788; 8029 pounds of fruit and dried vegetables were stored, valued at \$1476.50; 2680 gallons of brined vegetables were stored, valued at \$906.00; 204 community canners were installed with an approximate output of 445,-832. Total value of products put up and stored, \$251,170.50.

Girls' Canning Club Work.—It should be stated in this connection that the Girls' Club Work, as conducted by the Extension Service, is intensified, and is not to be reckoned in comparison with other efforts in Girls' Club Work, which consists mainly of enrolling girls and leaving them to take care of themselves, or follow instructions sent by mail. Under our system every girl received personal instruction from her county agent throughout the year, and it is worth saying that no other kind of club work, either for boys or girls, will accomplish any enduring results. In canning club work the enrollment was 3118, total number members reporting 1595; 1287 girls made demonstrations in cooking; 340 in bread; 46 scholarships were awarded; 76 perennial gardens were established; 752,385 pounds of tomatoes were raised from the 1-10 acre plats; 92,157 pounds of beans were raised from 1-10 acre plats; 83,077 cans of tomatoes were put up from the 1-10 acre plats; 28,488 jars of tomatoes were put up from the 1-10 acre plats; 49,922 cans of other vegetables were put up from the 1-10 acre plats; while 66,479 jars of miscellaneous products were put up; number of containers of tomato products (ketchup-pickle relish) from 1-10 acre plat, 16,002. Total value of all club products \$58,277.24; average cost of production from 1-10 acre, \$.531; average cost of canning per 1 1-10 acre, \$.737; average net profit per 1 1-10 acre, \$17.05. Total number of containers put up from the farm and orchard, 121,388; total number girls making towels and laundry bags, 1619; making caps, 1898; making uniform aprons, 1754; making uniform dresses, 981; 191 clubs held 2123 regular meetings during the year with an attendance of 48,734. The total products valued at \$58,277.24 on the 1595 one-tenth acres reported at a net increase shown of \$17.05 per 1 1-10 acre, reveals an increased production valued at \$27,194.75, which would not have come to the demonstrators had they not followed proper instructions, to say nothing of the fact that none of the \$58,277.24 would have been produced had not the club members been properly supervised and encouraged.

Boys' and Girls' Poultry Clubs.—875 members were enrolled; 600 fulfilled the minimum requirements as to eggs set and chickens raised, 187 taking charge of entire flock on farm; 319 raised feed for flock; 332 used pure-bred males at head of flocks; 64 made brooders; 64 purchased pure-bred stock; 347 purchased pure-bred eggs; average number of fowls in flock, 35; approximately 13,974 chickens were raised, and 5610 chickens approximately were fattened for market; 4 egg circles were organized; 1670 dozen eggs were sold cooperatively; 1546 pounds of market poultry were sold for a total of \$408.66; 255 pure-bred fowls were sold for breeding purposes for a total of \$265.00. Approximate total value of all poultry products, \$12,302.36.

BOYS' STATE AGRICULTURAL CLUB WORK.

Boys' Demonstration Club Work.—This is a subdivision of the farm demonstration work and the boys are handled through the county agents. There is a State Boys' Agricultural Club Agent and a State Pig Club Agent, also three field agents, added in September, who devote their entire time to this work. The work embraces the growing of field crops, such as corn, peanuts, cotton and kafir, and the raising of live-stock, such

as pigs, baby beef and lambs. The effects of the drouth in Texas on the boys' club work this year are revealed to a certain extent in the summary of the crop records. The drouth was not only responsible for low yields and high cost of production, but also the small number of reports submitted. Club members hesitate to submit a report when they made a poor record. It should also be mentioned that the reports were greatly handicapped by the fact that the department was unable to supply the record books to many of the club boys until after July 1—in fact, quite a number have not been received and we expect a number of others. Up to the present date (December 10, 1917) we have received 974 reports, as follows: Corn, 370; kafir, 57; yielding 25.9 bushels an acre, at an average cost of 40 cents per bushel; peanuts, 54, yielding 35.03 bushels an acre, at an average cost of .38 cents per bushel; cotton, 56, averaging 829 pounds seed cotton an acre, at an average cost of .03 cents per pound seed cotton; calf, 50, average initial weight baby beeves, 366 pounds, average final weight, 658.6 pounds, showing an average net profit of \$22.50, as contracted with an average net profit of \$17.70 for last year; pig, 387 reports.

SUMMARY OF REPORTS ON PIGS.

Fattening Phase.

Initial Value—Feeding Project:

Number of pigs, 29; value.....\$ 131.08

Initial Value:

Number of pigs, 29; value..... 1,087.77—Increase..\$ 956.69

Breeding Phase.

Initial Value:

Number of pigs, 43; value.....\$ 326.80

Number of pigs, 43; value..... 3,744.69—Increase..\$3,418.89

Sow and Litter Projects.

Number of sows, 97; value.....\$1,888.72

Brood Sows:

Value sows, pigs sold and on hand..... 7,069.05—Increase..\$5,180.33

Total\$9,555.91

Average yield of ten highest records of corn, 74.19 bushels per acre; average cost per bushel, 14 cents. Average yield of ten highest records in peanuts, 69.33 bushels per acre; average cost per bushel, 27 cents. Average yield ten highest records in grain sorghums, 36.3 bushels per acre; average cost per bushel, 24 cents. Average yield of ten highest records in cotton, 1572.7 pounds of seed cotton; average cost per pound of seed cotton, 3 cents. Average initial weight of three of the highest record baby beeves, 202.6 pounds; average final weight, 544 pounds; average net profit, \$36.54.

Three thousand six hundred and thirteen Corn Club boys were enrolled, being an increase of 1048 over last year; 1339 in cotton, being an increase of 448; 1433 in peanuts, increase 768; 800 in kafir, decrease 233; 5115 in pigs, increase 1756; 569 in baby beef, increase 79; lamb, 0, decrease 46. There were 92 agents at work during the organization season in 1917, compared with 80 during the corresponding season, 1916. The average enrollment per agent in 1917 was 132.6 members, compared with an average of 90.5 members in 1916. State exhibits and contests of club members were held at the State Fair, Dallas, Texas, and the Cotton Palace, Waco, Texas. Texas participated in an interstate club contest at the Oklahoma State Fair, Louisiana State Fair, and Southern Livestock Exposition at New Orleans, and secured third place at each of the contests. We feel that this showing was very creditable, considering crop conditions in Texas this year. There were 290 exhibits at the State Fair at Dallas, 80 exhibits at Texas Cotton Palace, 10 at Oklahoma State Fair, 10 exhibits at Louisiana State Fair, and 10 exhibits at the Southern Livestock Exposition; total, 390. A larger number of club members participated in the State and interstate contests than ever before. They have a tendency to stimulate the interest of the boys beyond their local achievements. It is our opinion, based upon experience and observation, that encampment schools for club boys furnish an excellent means for giving good agricultural instruction. It is a good form of "outing" and tends to bring the boys together socially and enables the county agents to make use of the "gang spirit" that is usually to be found in boys. Twelve encampment schools of two to five days duration, one State encampment school, and one short course at A. and M. College were held during the year with an approximate total attendance of 1050 club boys. It is our ambition to hold a county club encampment in practically every county next summer where the club boys are sufficiently organized. County encampments were held during the months of July, August and September in the following counties: Johnson, Travis, Williamson, Bell, Grayson, Houston, Freestone, Dallas, Childress, Dickens, Wilbarger and Lubbock. The average attendance at these encampments was about 40 club boys and there was a very good attendance of parents and other people during the day meetings. The attendance at the Bell county encampment was about 150, which was the second encampment of this kind which has been held in this county, while it was the first in the others. This indicates the interest it creates with the boys in their club activities. The State encampment at Dallas was a great success. There were 410 present, including about 40 county agents. The club boys were formed into a military organization, consisting of two battalions of four companies each. Each company was under the direct supervision of the captain. Assistant county agents were used as captains. The State Association entertained the club boys and county agents without cost for a period of six days, furnishing sleeping quarters, meals, passes into the fair grounds, etc. The only expense to the department in connection with the State encampment was the traveling expenses and the time of the staff members in conducting the encampment. One hundred and sixty-nine (169) club boys were assembled at the Agricultural and Mechanical College during the Farmers' Short Course in July. A special program for the club boys was arranged. They were organized into a

military organization. We plan to enlarge upon the encampment and short course feature of club work. We believe that it is time and money well spent.

Number of schools visited and meetings held in the interest of club work, 3126; approximate attendance, 120,706; community, county, State and interstate club contests reported held, 89; exhibits entered at above contests, 3730; livestock contests reported held, 42; county cash prizes, \$4747.10; value scholarships to encampment schools, etc., \$3103.55; value other prizes in county, \$1833.00; prizes given by State Fair, \$465.00; prizes given by Texas Cotton Palace, \$361.00; total value prizes given in State, \$10,909.65. Number visits to club members, 9594; approximate number of club boys who endeavored to carry out their work, 6494.

	Williamson	French	Johnson	Symonds	Hillam
Number of schools visited and meetings attended.....	145	115	22	21	32
Approximate attendance.....	12,921	14,122	1,800	4,620	2,061
Number of County Agents visited	87	48	25	25	13
Conference with parties other than County Agents in interest of club work.....	15	13	No data	No data	No data
Club demonstrations visited.....	50	No data	1	3	No data
Miles traveled by rail.....	18,227	15,003	6,838	2,732	1,788
Miles traveled by auto and other means of conveyance.....	2,591	2,080	336	612	525
Total miles traveled.....	20,818	17,083	7,174	3,344	2,313
Number letters written.....	1,742	799	95	61	18

It should be borne in mind that the figures given here reveal only a small part of the results obtained from club work. Farmers who could never be reached do not object to their boys being kept busy with a demonstration plat, a pig or baby beef, and yet, the results obtained are forced on his attention and eventually on the entire community until the most indifferent must be convinced by the actual results and the way is paved for better farming; besides the boys of today will be the men of tomorrow and figures cannot express the value of proper instruction and training during the formative period of the club boys' life.

NEGRO DEMONSTRATION DIVISION.

Negro Work.—The plan in the negro work for the past two years has been to work from the individual to the community and from the community to the county as a unit, not by lectures, but by actual demonstration of successful methods, both in the home and field. The special work of this division for the past fiscal year has been the growing of food and feed crops and conserving the same, emphasis being placed upon the growing of corn among the men and better gardening among the women, together with the canning, drying and pickling of vegetables and fruits. The staff is composed of a chief and stenographer, with headquarters at Waco; two agronomists and two home demonstrators, with headquarters at Prairie View, Texas. This force had to carry to practically a population of 700,000 people the message of a better way to do things in the field and at home. The need being great and the workers few, work was begun only in those communities where the inter-

est was great enough to justify our entering. Corn and canning clubs were organized in nineteen counties. Demonstration corn plats were cultivated in seventeen counties, while demonstration gardens were cultivated in ten counties. The result in all this work was exceedingly successful in the face of the severest drouth Texas has known for years and the figures are on file in our office, being reported in such form as to render them difficult to tabulate. Number of workers for full period in the field, 2; number of workers part of time (nine months) in the field, 2; leader and stenographer, 2; total, 6. Number counties regularly visited by agronomist, 18; number counties regularly visited by demonstrators home economics, 20; number canning clubs visits regularly, 47; number demonstration corn plats and clubs visited regularly, 34; number members corn clubs, 782; number members canning clubs, 1142; number demonstration gardens visited regularly, cultivated and used as object lessons in gardening, 18; number hot water canners bought during the year by clubs, 54; number cans bought by club members during the fiscal year, 24,500; number demonstrations given in canning, 162; cans and jars put up by regular club members, 88,672; cooperators reached by single lectures, 574; jars and cans put up by people not regularly organized or regularly visited, 20,500; miles traveled by the entire staff, 48,796; numbers boys' corn clubs organized, 16; number girls' tomato clubs organized, 20; number boys competing for prizes at Cotton Palace, 16.

The actual value of demonstration methods as advocated by the Extension Service was tested out thoroughly this year, for in all the counties where demonstration plats were secured, except one, there was a serious drouth, and there was a general failure of the corn crops, except in the case of the demonstration plats and those of cooperators, where the crops were worked as directed. On the latter plats crops were good, except in the case of Falls and Brazos counties, and in these instructions were not followed.

WOMEN'S DIVISION.

Rural Women's Work.—The activities of this division are devoted to the instruction of rural women in rural home economics. In order to give this instruction efficiently and at the minimum cost organizations of rural women have been formed. Regular written lessons are furnished these clubs and at regular intervals demonstrators are sent, who give personal instruction in such branches of rural home economics as bread making, canning, gardening, and poultry, also household conveniences are sent to various groups of clubs. One of the best features of the work is the growth of the cooperative spirit among the women as shown in their working together to make money for their churches and schools. In some instances, they have begun cooperative buying and selling. Reports on file in this office show:

Number of clubs at the beginning of the year.....	67
Number of clubs organized during year (January to September)	79
Number of courses of study sent out to clubs.....	375
Number of lessons (four lessons to each course).....	1,500
Aggregate number of lessons sent out to members of clubs.....	9,940
Number of active clubs to date.....	60

The chief of the division and principal worker suffered a serious accident some months ago and after a lingering illness of several months, died, consequently the reports on this work are not as complete as desired.

MOVABLE SCHOOLS DIVISION.

Movable Schools.—In this work the specialist in Home Economics, with the assistance of 371 volunteer demonstrators, through instruction and advice, saved 2,474,000 containers of food, notwithstanding the fact that almost the entire State was drouth-stricken and a large percentage of the food and feed crops were destroyed. This specialist cooperated with the county agents and gave a total of seventy-nine lectures and demonstrations with an attendance of 5,420, wrote over 1,000 letters in answer to inquiries for advice and instruction and traveled 6,612 miles to reach communities where instruction and training had been requested.

The terracing specialist has on file in our office a detailed report filled with such declarations as these from farmers in Texas: "Last year on the thin land near the top of the hill I got eight bushels of corn more per acre on land which was terraced than I did on better land near the foot of the hill which had not been terraced." Another says: "The terracing is worth \$2,000 to my 100-acre farm." A third reports: "The terracing probably cost \$50.00, and the increase in crop yield in 1916 was worth \$1,500.00 over the average." Space will not permit the enumeration of even a small per cent of these enthusiastic comments, but suffice it to say that these activities have been worth many thousands of dollars to Texas farmers. During the year ninety-four field demonstrations were made, 494 terraces were established, covering 1,655 acres with a total attendance of 3,196 to take advantage of the instruction given. These demonstrations were made in various sections of the State in order that as many as possible might be benefited and it was necessary to travel 18,368 miles to respond to the numerous requests for advice and counsel in this work.

In the rural school work marked progress is shown. Forty teachers' institutes, representing fifty-four counties, were visited in the interest of instruction in home projects, with an attendance of 5,160, while 1,100 letters of inquiry were answered. Number of schools selected for home projects, 12; number of pupils beginning home projects in selected schools, 448; number of circulars prepared on home projects and mailed, 1,000; total visits made to give instruction in home projects, 106; total class demonstrations, 100; total attendance, 3,905; evening lectures given, 76; attendance evening lectures, 3,905; number community meetings held, 56; number school farms supervised, 13; number of acres in school farms, 62; number individual gardens supervised, 400; number of home gardens by pupils in selected schools, 133; total number present at demonstrations and lectures, 12,749.

REPORT OF THE DEPARTMENT OF MILITARY SCIENCE
AND TACTICS.

September 1, 1918.

President W. B. Bizzell, Campus.

In compliance with instructions from your office, I have the honor to submit the following report for the sessions 1916-17 and 1917-18. In view of the fact that I was detailed at this institution in April, 1918, the reports are taken from the records of the office.

THEORETICAL INSTRUCTIONS, 1916-17.

R. O. T. C. Military Instructions, 1916-17.

Basic Course.

Freshmen :	Hours.
Drill regulations (to include school of company).....	7
Theory of target practice.....	2
Military organization	1
Map reading	1
Service of information.....	1
Service of security.....	1
Camp sanitation	1
Military obligation of citizenship, lecture.....	1
Personal hygiene	1
Total.....	16

Sophomore :	Hours.
Drill regulations	10
Service of information.....	1
Service of security.....	1
Small arms firing manual.....	4
Total.....	16

Advanced Course.

Junior :	Hours.
Theory military sketching.....	8
Minor tactics	28
Elements International Law, lecture.....	7
Military history, lecture.....	4
Company administration, lecture.....	1
Property accountability, lecture.....	1
Total.....	49

Senior:	Hours.
Minor tactics	28
Rifle in war, lecture.....	1
Psychology in war, lecture.....	1
General principles of strategy, lecture.....	5
Elements of International Law, lecture.....	4
Court martial manual, lecture.....	3
Military history, lecture.....	5
Company administration, lecture.....	1
Property accountability, lecture.....	1
Total.....	49

PRACTICAL INSTRUCTION, 1916-17.

Close order drills in the schools of the soldiers, company and battalion, also ceremonies:

Extended order drills, and field exercises.

Position and aiming drills.

Gallery practice.

Qualification course for organized militia, to include firing at 300 yards.

Intensive drills, ten hours per week during April and May, special attention being given to bayonet exercise.

Guard duty in the halls of dormitories during study hours at night.

TRIPS OF THE CORPS.

To Waco and Houston in November to witness football games with Baylor University and Rice Institute teams. Conduct very good.

DISCIPLINE.

Excellent with increasing evidence that the members of the cadet corps are cooperating with the College authorities in maintaining good order.

DORMITORIES.

There are several buildings used as dormitories that have served their usefulness and should be replaced with modern structures adapted to units of organization as outlined for the army, viz.: Foster, Austin, Pfeuffer, and Ross Halls.

ANNUAL INSPECTION.

The War Department has classified military institutions into four classes, as follows:

Class M. C.: Comprises those institutions which confer a degree and which are essentially military in character. By "essentially military" is meant that the students are quartered in dormitories and are constantly in uniform and under discipline.

Class C.: Includes those institutions "not essentially military" that is in which military instruction is confined to a few drills and lectures

per week, but the students appear in uniform only when engaged in military exercise.

Class M. S.: This refers to institutions of the preparatory class which confer no degree, but which, like Class M. C., are essentially military in character.

Class M.: Comprehends all other institutions which offer any kind of military instruction that is recognized by the government.

Each year the War Department sends to schools receiving aid and recognized an officer of the general staff, who makes a thorough inspection. This officer notes carefully the standards of discipline and the proficiency exhibited by the students in military training.

The ten colleges that have exhibited the highest degree of excellence in military training are designated by the Secretary of War as "distinguished institutions," and, similarly, ten essential military schools are designated as "honor schools."

Naturally, to be designated as an honor school is a distinction to be highly prized by the favored institution. The honor carries with it both prestige and the privilege of naming a graduate for a commission as second lieutenant in the regular army. The graduate so designated by the College may be commissioned by the President of the United States without mental examination.

The Agricultural and Mechanical College of Texas has ranked as an honor school since 1910.

RESERVE OFFICERS TRAINING CORPS.

The organization of the Reserve Officers Training Corps greatly increased the efficiency of the College military department, and has been the means of furnishing a large number of officers for the army and marine corps. The training and courses of instruction was carried through to the close of session, 1917-18.

FRED W. ZELLER,
Major Infantry, U. S. A.

REPORT OF THE ATHLETIC DEPARTMENT.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: Your letter to Mr. W. L. Driver, our athletic director, directing him to submit the biennial report of the Athletic Department, did not reach him until the day that he started for the north to attend the training camp for athletic directors at Princeton, N. J.; for this reason the biennial report has been delayed.

FOOTBALL—FALL OF 1916.

Athletics opened in September, 1916, with Mr. E. H. W. Harlan as head coach in football, Mr. D. V. Graves, assistant, and Mr. D. X. Bible as freshman coach.

For the first time in the history of Texas colleges freshmen were not permitted to take part in inter-collegiate athletics by a rule passed by the Southwest Athletic Conference, of which this institution is a member. This made it necessary to provide a freshman coach.

Nine games of football were played, the scores being as follows:

Date	Where Played	A. & M. Score	Opponents	Score
Oct. 6	College.....	6	Southwestern University.....	0
Oct. 14	Galveston.....	0	Louisiana State.....	13
Oct. 20	College.....	77	Rolla School.....	0
Oct. 29	Dallas.....	13	Haskell Indians.....	6
Nov. 4	Houston.....	0	Rice.....	20
Nov. 11	Waco.....	3	Baylor.....	0
Nov. 18	College.....	62	Southern M. U.....	0
Nov. 24	College.....	20	Dallas University.....	7
Nov. 30	Austin.....	7	Texas University.....	21

This team may be considered fairly successful as six out of the nine games were won, only losing two important State games.

The freshman team, coached by Mr. Bible, played five games and won them all. Mr. Bible demonstrated very forcibly that he is an excellent coach. During the latter part of the football season Mr. Bible was loaned to Louisiana State University to finish out their season for them as their coach resigned about a month before the season closed. Mr. Bible was made a very attractive offer by L. S. U. to remain with them, but he preferred to return to Agricultural and Mechanical College.

Mr. Harlan was an excellent coach, but his experience had been in the North with teams made up of men that had attended high schools and preparatory schools and who had received at least three or four years of excellent coaching before Mr. Harlan got hold of them. In other words, they had been taught the fundamentals of the game. This was our chief objection to him, he took it for granted that the men on

his teams here would know the fundamentals and his coaching, as a whole, was too advanced in the beginning, for our team. The Athletic Committee felt that the College was not getting value received for the money being paid Mr. Harlan and decided about the end of the season that Mr. Bible was the best and most logical man to succeed him. After his return from Louisiana an agreement was entered into with Mr. Bible in which he was to be given two years try-out. He stated that he did not feel that he could do full justice in one year. His salary was fixed at \$2400 for the first year and \$2600 for the second year. Mr. Harlan was paid \$2000 for the football season and a house furnished him free, salary from Athletic Council funds. Mr. Graves received his salary as head coach of baseball. Mr. Bible received his salary from College funds, being employed as tutor for backward students with the understanding that he was to assist in coaching during the entire year.

NOTE.—Our sincere thanks are due President Bizzell for this arrangement.

The attendance of the Varsity football squad averaged fifty men during the entire season.

Inter-company football was again very popular among the students. A regular schedule was played, CD Company winning the championship. At least two hundred men participating.

The football season for 1916 was in some respects a disappointment, especially in results obtained. Three games were lost, one to Louisiana State University, one to Rice Institute, and one to Texas University. The team, however, tied for the Southwest Conference title in games percentage. In many ways the season was successful. The largest number of spectators that have ever witnessed an Agricultural and Mechanical College team in action attended the nine games. A conservative estimate by Mr. Driver places the number at 42,000. The largest crowd at an athletic contest south of the Mason-Dixon line witnessed the Thanksgiving game against the University at Austin. The crowd was estimated to be 15,800 and the receipts for the game were approximately \$21,000. Financially, it was the best season ever experienced by A. and M. Every obligation, composed of outstanding accounts several years old, notes due the banks and all current expenses were met. Many needed improvements were also made.

BASKETBALL—WINTER OF 1917.

Practic in basketball began in January, 1917, with Lieutenant W. H. H. Morris, assistant comandant, as coach of the Varsity squad, and Mr. D. X. Bible as coach of the freshman squad. Twenty games were played, twelve won and eight lost. The scores being as follows:

Date	Where Played	A. & M. Score	Opponents	Score
Jan. 11	College.....	47	Southwestern University.....	16
Jan. 12	College.....	39	Southwestern University.....	11
Jan. 15	Houston.....	16	Rice Institute.....	19
Jan. 16	Houston.....	21	Rice Institute.....	13
Jan. 17	Lafayette, La.....	23	Southwestern Ind. Inst.....	16
Jan. 18	Baton Rouge, La.....	15	Louisiana State University.....	24
Jan. 19	Baton Rouge, La.....	14	Louisiana State University.....	30
Jan. 20	New Orleans, La.....	26	Tulane University.....	42
Jan. 24	College.....	36	Daniel Baker.....	0
Jan. 25	College.....	37	Daniel Baker.....	5
Jan. 29	College.....	31	Baylor University.....	8
Jan. 30	College.....	20	Baylor University.....	13
Feb. 12	College.....	29	Texas Christian University.....	18
Feb. 13	College.....	42	Texas Christian University.....	18
Feb. 19	College.....	24	Rice Institute.....	25
Feb. 20	College.....	27	Rice Institute.....	20
Feb. 23	Austin.....	19	Texas University.....	24
Feb. 24	Austin.....	16	Texas University.....	36
Feb. 26	College.....	29	Texas University.....	15
Feb. 27	College.....	16	Texas University.....	24

At the beginning of the season we had great hopes that this team would win the Conference championship and its record of winning twelve games and losing eight was not very satisfactory. In their trip to Louisiana they lost the major portion of the games. On their home court they played an excellent game, losing only two games, one to Rice Institute and one to Texas University.

The freshman team, under Mr. Bible, as coach, played four games, winning two of them and losing two to the strong Houston High School team.

Lieutenant Morriss was paid \$100 per month for three months for coaching basketball, the money being paid out of Athletic Council funds.

Inter-company basketball proved as popular as usual, the championship being won by IK Company. About 200 men participating.

TRACK—SPRING OF 1917.

Mr. C. E. Firth, Y. M. C. A. director for the College, coached the track team. Early prospects were excellent for a good team, but with the opening of the war the seniors began to leave for training camp or began to enlist in some branch of the army and practically all of the experienced men were lost. An excellent schedule had been planned, but all meets were cancelled except the triangular meet between A. and M., Rice Institute and the University of Texas, which was held at Houston. We came out last in this meet, the University of Texas winning, Rice second. We attribute our poor showing in this meet to the fact that so many of our men were in the army and at the last minute several of the regular men were unable to make the trip.

The conference track meet which was to have been held at Norman, Oklahoma, with the University of Oklahoma, was called off on account of the war.

Through the courtesy of President Bizzell, Mr. Firth was loaned to the Athletic Council as track coach and the Council desires to acknowledge its obligation to President Bizzell for allowing Mr. Firth to coach the team and to Mr. Firth for his patience and the excellent instruction he gave the men on the team.

BASEBALL—SPRING 1917.

Dr. D. V. Graves again coached the baseball team, and everything considered, the season was very successful. The opening of the war took some of the best men from his team. The games played and scores are as follows:

Date.	Where Played	A. & M. Score	Opponents	Score
.....	College.....	15	Southwestern Ind. Inst.....	3
.....	College.....	7	Southwestern Ind. Inst.....	3
.....	Houston.....	7	Rice Institute.....	8
.....	Houston.....	7	Rice Institute.....	7
.....	Baton Rouge, La.....	3	Louisiana State University.....	3
.....	Baton Rouge, La.....	6	Louisiana State University.....	3
.....	Lafayette, La.....	5	Southwestern Ind. Inst.....	3
.....	Lafayette, La.....	4	Southwestern Ind. Inst.....	1
.....	College.....	16	Daniel Baker College.....	7
.....	College.....	1	Daniel Baker College.....	4
.....	College.....	12	Texas Christian University.....	5
.....	College.....	8	Texas Christian University.....	0
.....	College.....	5	Texas University.....	9
.....	College.....	4	Texas University.....	1
.....	Austin.....	5	Texas University.....	8
.....	Austin.....	2	Texas University.....	5
.....	College.....	3	Baylor University.....	3
.....	College.....	3	Baylor University.....	2

Total games won, 10; tied, 3; lost, 5.

Mr. Graves was paid a salary of \$2200, \$2000 being paid from College funds and \$200 from Athletic Council funds. In addition, Mr. Graves was paid \$100 from Athletic Council funds for teaching in summer school.

Mr. W. L. Driver, Director of Athletics, was given a leave of absence in the spring to attend the officers' training camp at Leon Springs. Mr. D. V. Graves was made acting director.

Mr. Driver resigned from the officers' training camp before receiving his commission in order to go into athletic work in the army. At this time a call had been made for athletic men and he felt that he could best serve in the work that he had spent the earlier years of his life preparing for. He was unsuccessful in getting into this work and returned to the College in September to take up his duties as Athletic Director.

Mr. Driver's salary of \$2200 was paid as follows: \$2000 from College funds as Director and \$200 from the Athletic Council funds.

In January, 1917, it became necessary to employ an office man, and Mr. P. F. Fox was employed at a salary of \$75 per month.

Financially, this year proved the most successful the College Athletic Department has ever experienced. Every obligation was met and paid, and for the first time in a good many years the Athletic Council was entirely out of debt. The following is a brief statement of the finances for the year:

Receipts:

Football	\$26,555 83	
Basketball	1,471 44	
Baseball	2,249 80	
Track	138 70	
	<hr/>	\$30,415 77

Expenditures:

Football	\$23,203 94	
Basketball	2,847 08	
Baseball	3,168 79	
Track	500 41	
Tennis	64 20	
	<hr/>	29,784 42

Leaving a balance of..... \$ 631 35

Among the expenditures may be mentioned \$6292.78 for permanent improvements and old bills paid amounting to \$6620.80. The balance being spent for incidentals, office and salaries, equipment, officials for games, guarantees to visiting teams and advertising.

FOOTBALL—FALL OF 1917.

The football season opened with Mr. D. X. Bible as head coach, Mr. D. V. Graces, assistant, and Dr. R. N. Blackwell, an osteopath, as trainer.

Your committee has been dissatisfied for several years with the number of injuries received by men in football and which the committee felt were unnecessary with the proper attention. This was the reason that Dr. Blackwell was employed as trainer. Only one member of the team received what could be termed a serious injury and this was due to the fact that McClintock disobeyed the trainer's instructions and left off a bandage that he should have used. The result was a seriously sprained ankle that kept McClintock out of the game practically the whole of the latter part of the season. Dr. Blackwell was an excellent trainer and the committee regrets very much that it has found it necessary to dispense with his services. The entire athletic department joins in stating that Dr. Blackwell is an excellent trainer and proved a wonderful help during the season, but there was some friction, and it was deemed unwise to re-employ him.

This football team made the most wonderful record that has ever been made in the South; in fact, but few institutions have ever duplicated it. At the beginning of the season the team was composed mostly of freshmen, who were permitted to play because the Southwest Athletic Conference set aside its rule, for the duration of the war, forbidding the freshmen to take part in inter-collegiate athletics. Most of the old men, both seniors and juniors, had enlisted in some branch of the army or navy, but under the skillful teaching of Coaches Bible and Graves, the few old men remaining, the members of Coach Bible's freshman team of the season before, and the freshmen were developed into our wonderful 1917 team. Their record for the season was 270 points to their oppo-

nents nothing. Only two teams were able to penetrate their twenty-yard line, so perfect was the defense of the line coached by Mr. Graves. On offense, the brilliant work of the back field showed the careful and successful teachings of Mr. Bible. The season was full of thrills. The gradual development of the team to the finished machine, the interest of the whole State in the outcome of the season and the results of the games with our three greatest rivals filled column after column of the newspapers. Baylor University and the University of Texas were defeated in turn and then came the hardest game of the season on Thanksgiving against Rice Institute. They had an undefeated team and the winner of that game would be the champions of the Conference. Their team seemed better than ours and they were confident of victory. A crowd of 12,000 saw them defeated in the football classic of the year for the State of Texas. The winning of the game made us the undefeated and undisputed champions of the State and of the Southwest.

Eight games of football were played, all of them being won, the scores being as follows:

Date.	Where Played	A. & M. Score	Opponents	Score
Oct. 5	College.....	66	Austin College.....	0
Oct. 12	College.....	98	Dallas University.....	0
Oct. 22	College.....	20	Southwestern University.....	0
Oct. 27	San Antonio.....	27	Louisiana State University.....	0
Nov. 2	College.....	35	Tulane University.....	0
Nov. 10	Waco.....	7	Baylor University.....	0
Nov. 20	College.....	7	University of Texas.....	0
Nov. 29	Houston.....	10	Rice Institute.....	0
Totals.....		270	.....	0

Thanksgiving night, after we had defeated Rice Institute, Mr. Bible left for San Antonio, where he enlisted in the aviation branch of the army. He returned to College within a few days and remained until some time in January, when he was called to begin his training. Your committee felt that Mr. Bible had earned the greater part of his salary for the year and paid him a total of \$1600 and at the same time gave him an unlimited leave of absence. He is to return to us after the war. Mr. Bible was to be paid \$2400 for the year, salary from Athletic Council funds.

Mr. Graves' salary was paid as head coach in baseball.

Mr. Blackwell was paid \$600 for three months through the football season and made an allowance of \$50 for expenses. Dr. Blackwell was also called in, as occasion demanded, to treat members of other teams during the year.

The inter-company championship in football was won by CD. About the usual number of men participated.

The football season for 1917 was in every way a success. Nearly all of the principal teams of the Conference were defeated. The corps of cadets attended two of the games off of the campus (the Baylor game at Waco and the Rice game at Houston), and sportsmanlike conduct was observed at all times. The receipts for the season were lighter than the previous year on account of the war, but the Thanksgiving

game at Houston against Rice Institute was witnessed by an exceptionally large crowd. This overcame the losses or light receipts in other games.

A number of necessary improvements were made, among which may be mentioned: An additional dressing room, hot water system of heating dressing rooms and shower baths installed, and new lockers for the dressing room.

BASKETBALL—WINTER OF 1918.

Due to the fact that we desired to curtail expenses as much as possible, and also the scarcity of coaches, it was decided that Mr. Driver, our athletic director, should coach the basketball team.

The team was composed of almost entirely new men with but slight experience in basketball. The team was in fact the lightest in weight that we have ever had.

Eighteen games were played, the scores being as follows:

Date	Where Played	A. & M. Score	Opponents.	Score
Jan. 15	College.....	21	Camp McArthur.....	19
Jan. 17	College.....	26	Southwestern University.....	13
Jan. 25	College.....	14	Rice Institute.....	18
Jan. 26	College.....	25	Rice Institute.....	21
Jan. 30	Abilene.....	17	Simmons College.....	19
Jan. 31	Abilene.....	0	Simmons College (forfeited).....	2
Feb. 1	Waco.....	14	Baylor University.....	23
Feb. 2	Waco.....	19	Baylor University.....	9
Feb. 5	College.....	15	Oklahoma A. and M.....	8
Feb. 6	College.....	21	Oklahoma A. & M.....	19
Feb. 11	College.....	31	Baylor University.....	25
Feb. 12	College.....	22	Baylor University.....	15
Feb. 15	Austin.....	15	Texas University.....	27
Feb. 16	Austin.....	21	Texas University.....	12
Feb. 21	College.....	9	Texas University.....	8
Feb. 22	College.....	12	Texas University.....	17
Mar. 1	Houston.....	26	Rice Institute.....	27
Mar. 2	Houston.....	21	Rice Institute.....	29
Totals.....		329		311

Nine games were won and nine lost, two of those lost being forfeited. A total of 329 points were made to our opponents 311, showing that we had an average team as compared with the other teams we met. The second game to be played with Simmons College on January 31st was forfeited by Mr. Driver rather than play the game. The President of Simmons College acted in a very unsportsmanlike manner, so Mr. Driver reported, and he thought it wisest to bring the team home rather than stay and perhaps have trouble. In the first of the games played at College against the University of Texas they protested our using one of our players because his eligibility card had not been sent to the President of the Conference. We felt sure that this card had been sent in, for the man was otherwise eligible, and played the man in spite of the protest. It developed later that the player had confused his equipment card with his eligibility card and when all members of the team were asked if they had signed eligibility cards he, with the others, reported he had. Technically the man was ineligible and there was no other course but for us to yield the game to them, though we had won it.

As a whole this basketball season may be considered very satisfactory, considering the fact that we lost men from the team at different intervals that seriously handicapped Coach Driver in the development of the team.

Mr. Driver received his salary as Director of Athletics, mentioned later.

In the company league, CD Company won the championship in basketball. A very large number participated in company basketball this season.

TRACK—SPRING OF 1918.

The track team was coached by Professor H. R. Brayton of the Department of Chemistry. No regular coach was available, and as Mr. Driver was busy with the basketball team and Mr. Graves with the baseball team at the same time, there was no other recourse but to get one outside of the regular athletic staff to do the coaching. Professor Brayton proved to be a very satisfactory coach and did a great deal to stimulate interest in track. Mr. Brayton was paid \$50 per month for three months from Athletic Council funds.

As a whole the season was a success. In a dual meet with Baylor University at College, A. and M. won by the large score of 78½ to 30½. In a dual meet at Austin against the University of Texas we lost by a very narrow margin, the score being 57½ to 51½ points. The Southwest Athletic Conference meet was held at Norman, Oklahoma, on a very muddy field, at the University of Oklahoma. A. and M. took fifth place, beating two of the strongest Texas teams, Rice Institute and Baylor University.

The track squad averaged thirty men in attendance during the whole of the track season.

BASEBALL—SPRING OF 1918.

Mr. D. V. Graves, head coach of baseball, again handled the baseball team with his usual success, notwithstanding the handicaps.

Nineteen games were played, fifteen won and four lost. The schedule was as follows:

Date	Where Played	A. & M. Score	Opponents	Score
Mar. 19	College.....	2	Howard Payne.....	1
Mar. 20	College.....	2	Howard Payne.....	0
Mar. 25	Fort Worth.....	10	Texas Christian University.....	2
Mar. 26	Fort Worth.....	3	Texas Christian University.....	2
Mar. 27	Waco.....	10	Baylor University.....	6
Mar. 28	Waco.....	9	Baylor University.....	6
April 3	College.....	2	Southwestern University.....	1
April 4	College.....	4	Southwestern University.....	3
April 10	College.....	10	Houston League Team.....	7
April 18	College.....	1	University of Texas.....	0
April 19	College.....	3	University of Texas.....	5
April 24	College.....	9	Baylor University.....	0
April 25	College.....	1	Baylor University.....	2
May 2	College.....	1	Rich Field Aviators.....	0
May 3	College.....	2	Rich Field Aviators.....	0
May 10	Austin.....	1	University of Texas.....	2
May 11	Austin.....	6	University of Texas.....	7
May 13	Georgetown.....	0	Southwestern University.....	1
May 14	Georgetown.....	5	Southwestern University.....	0
Totals.....		81		45

In the company league CD Company won the championship in baseball. This company won three championships during the year.

Mr. Graves' salary of \$2400 was paid as follows: from College funds, \$2000; from Athletic Council funds, \$200; house rent, \$200.

SOCGER FOOTBALL—SPRING OF 1918.

For the first time in its history the College attempted to have a soccer football team. Captain Martin, the officer detailed to the College by the Canadian government, coached the team. Work was not started until late and the team was only able to secure one game, which was played against Baylor University at Waco, on a very muddy field, and lost by a score of 3 to 0.

Very little interest has been shown in soccer football at this College. It may interest you to know that the team was made up almost entirely of foreign students, the greater part of them being from South America.

TENNIS—1917.

Mr. James Sullivan of the Feed Control and Professor W. H. Thomas of the English Department very kindly coached the tennis squad. Due to war conditions no attempt was made to secure meets.

BOXING—1917.

Captain Martin, the Canadian officer, introduced boxing as part of the military training, and Mr. Driver assisted him in teaching the men. The Council expects to assist this sport as much as possible and will add enough equipment to that owned by the military department to instruct at least one complete company at a time.

The total receipts for the year were approximately \$4000 less than the year previous, due, we believe, entirely to war conditions. The following is a brief statement of the finances for the year:

Receipts:

Football	\$24,118 82	
Basketball	687 53	
Soccer	75 00	
Baseball	1,496 29	
Track	396 55	
		<hr/>
		\$26,774 19

Expenditures:

Football	\$19,124 34	
Basketball	2,015 56	
Baseball	4,268 53	
Soccer	109 79	
Boxing	18 00	
Track	1,042 55	
		<hr/>
		26,598 80

The difference	\$ 175 39
House rent	50 01
Balance last year.....	631 35
	<hr/>
On hand August 31, 1918.....	\$ 856 75

Expenditures covered \$1532.17 for permanent improvements, the balance being for incidentals, office salaries, hotel and traveling, equipment, officials for games, guarantees and advertising.

Mr. Driver's salary as director for this year was \$2600, \$2000 from College funds and \$600 from Athletic Council funds.

A study of the financial statements of this and the previous year shows that none of the sports are self supporting except football and that this sport supports all others.

Some explanation should be made of the increased expenditures of the past year in comparison with those of the year before. Incidentals were twice as great but we had a championship team and the Council gave them additional medals that war prices made very expensive. Also expensive blankets were given to the seniors of athletic teams. This was the largest item of increase. Our salary account was about \$2500 above the previous year. Hotel and traveling was about the same as was equipment. Officials cost us about twice what they did the year before because the best officials of the State entered into an agreement among themselves to raise their fees.

Guarantees for games were greater due to increase in railroad fares, hotel rates and the fact that the various teams demanded larger guarantees than ever before.

The general improvement in the moral tone of our athletics is very gratifying to the members of your athletic committee. There are still a few rough spots left but we believe they will be entirely eliminated with the beginning of another college year. Especially is this gratifying to the chairman of your athletic committee. His connection with athletics began at a time when all of the A. and M. teams were called a "bunch of rough-necks" and it has been his ambition to see A. and M. get rid of the element that has caused such terms to be applied to them. He believes that all of the 1918-19 teams will be absolutely clear of such characters and with the high class men that we have for coaches he believes that it will never again be said that A. and M. teams are composed of men that are not gentlemen and that have been coached to play dirty, underhand games.

Financially the statements show that athletics is solvent and it is hoped that even with the retrenchments that have been made necessary by the war, we can still break even during the coming year. As soon as conditions resume the normal we have no doubt of our ability to make all the improvements that are necessary from time to time for the handling of varsity athletics and to pay all the other expenses necessary for conducting varsity athletics provided you continue to help us with our salary roll as you have done in the past.

The war has taught us the absolute necessity of properly directed athletics and it is to be hoped that some day we may have a gymnasium in order that a larger portion of the student body can take part in some branch of physical exercise.

Respectfully submitted,

A. C. LOVE,
Chairman, Faculty Athletic Committee.

REPORT OF DIRECTOR OF SUMMER SCHOOL.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: I am submitting below a report of the summer sessions of the College for the two years ending August 31, 1918.

ATTENDANCE.

The attendance, by divisions, is tabulated below:

	Session of 1917	Session of 1918
Rural Life:		
Men.....	12	35
Women.....	7	19
	19	54
Normal:		
Men.....	27	13
Women.....	39	49
	66	62
College:		
Men.....	41	41
Women.....	1	9
	42	50
Cotton Classing		
Men.....	79	26
Farmers' Short Course		
Men, women, boys and girls.....	926	750
Grand total.....	1132	942

Below is a statement showing, by divisions, the courses given and the number of students in each course;

Subject	Session of 1917	Session of 1918
Rural Life		
*Administration of High School Agriculture.....		21
Agricultural Extension and Demonstration.....		4
Athletic Practice.....	12	10
Domestic Art and Household Management.....	5	8
Domestic Science.....	8	16
*Economic Entomology.....		5
*Elementary Crop Production.....		18
Field Crops.....	6	8
Farm Dairying.....		9
Family Garden and Orchard.....	7	
*Farm Management.....		3
Farm Terracing.....		5
High School Agriculture.....	3	
Home Dairy and Dairy Products.....		9
*Home Demonstration Methods.....		12
Home Poultry Yard and Poultry Products.....	4	
Live Stock Feeding.....	8	7
Manual Training.....	4	3
Market Types and Breeds of Live Stock.....	4	3
*Market Types of Horses and Swine.....		20
Military Practice.....		12
Military Science.....	3	3
Plant Propagation and Orcharding.....	3	

*Not offered in Session of 1917.

Subject	Session of 1917	Session of 1918
Playground Direction.....	2	3
Poultry.....	4	8
Rural Education.....	2	1
Soils and Fertilizers.....	7	8
Tractors.....	4	2
Vegetable Gardening.....	7	5
Normal		
Algebra.....	17	20
Arithmetic.....	20	20
Bookkeeping.....	6	1
Chemistry.....	5	4
Civil Government.....	14	10
Descriptive Geography.....	23	24
Elementary Agriculture.....	25	16
English Composition.....	15	16
English Grammar.....	22	24
General History.....	10	17
History of Education.....	3	3
Literature.....	7	9
Physical Geography.....	9	6
Physiology and Hygiene.....	21	18
Physics.....	6	5
Plane Geometry.....	17	18
Primary Methods.....	5	9
Psychology.....	4	2
Reading and Spelling.....	20	17
School Management.....	15	17
Solid Geometry.....	9	4
Texas History.....	7	3
Trigonometry.....	3	
United States History.....	23	22
College		
Administration of High School Agriculture.....		8
Algebra (First Term).....	1	5
Algebra (Second Term).....		4
Analytics.....		5
Chemistry (Inorganic, First Term).....	6	6
Chemistry (Inorganic, Second Term).....	9	16
Civil Engineering (Field Practice).....	24	
Drawing (Freehand, First Term).....		3
Drawing (Freehand, Second Term).....		1
Drawing (Descriptive Geometry, First Term).....		3
Drawing (Descriptive Geometry, Second Term).....		4
Drawing (Mechanical).....		3
Economics (Fundamental Principles).....	8	8
Economics (Modern Business Corporation).....		2
Economics (Rural).....		2
French.....		6
History of Education.....		2
Manual Training.....		3
Market Types of Cattle and Sheep.....	6	7
Market Types of Horses and Swine.....		4
Physics (General Principles, First Term).....	6	7
Physics (General Principles, Second Term).....		10
Plane Trigonometry.....		2
Rhetoric and Composition (First Term).....		10
Rhetoric and Composition (Second Term).....	10	3
Rural Education.....		5
Soils.....		3
Spanish.....		4
Vegetable Gardening.....	1	4
Vocational Education.....	1	5

The attendance in all divisions of the 1918 summer session shows a decrease of 16.8 per cent as compared with that of 1917. This decrease is unquestionably the result of war conditions. The cotton classing school and the farmers' short course suffered the greater part of this loss, the attendance in the 1918 cotton classing school being 67 per cent less than in 1917, while the 1918 farmers' short course suffered a decreased attendance of 19 per cent as compared with 1917. It is gratifying to

note that the attendance in the 1918 rural life school was 184 per cent greater than in 1917. In the summer normal division the attendance in both years was approximately the same, although in 1918 there was a decided decrease in male students, and a corresponding increase in the number of women. The attendance in the college division was 19 per cent larger in 1918 than in 1917.

Respectfully submitted,

J. O. MORGAN,
Director.

REPORT OF DIRECTOR OF FARMERS' SHORT COURSE.

College Station, Texas, September 1, 1918.

W. B. Bizzell, President, A. and M. College, Campus.

DEAR SIR: I take pleasure in handing you, herewith, a report of the Ninth Annual Farmers' Short Course.

DATE AND PLACE OF MEETING.

The Ninth Annual Farmers' Short Course was held at College Station July 22-27, 1918.

ATTENDANCE.

The attendance, including men, women, boys and girls, was seven hundred and fifty. I consider this to be a remarkable showing when we consider:

1. That we were not able to announce railroad rates until a few days before the course opened.
2. That we had at the College, at that time, about two thousand soldiers.
3. That the State was passing through, at that time, the most destructive drouth in its history.
4. That, on account of the uncertainty in regard to holding the course, very little advertising was done.

CHARACTER OF WORK.

The motto of the Short Course was "Help Win the War by Learning How to Become More Proficient in the Production and Conservation of Food." Each division of the Short Course stressed the importance of food production and conservation.

A thirty minute patriotic service was held preceding each evening session.

Three general lectures on agricultural subjects were given each morning at the Airdome. These were followed, in the afternoon, by special work given by the following departments: Agricultural Engineering, Agricultural Education, Agronomy, Animal Husbandry, Biology, Dairy Husbandry, Entomology, Horticulture, Poultry, and Veterinary Medicine. In addition to these, there were special courses offered for women, girls and boys.

A full course was offered in food conservation, consisting of canning and preserving of fruits and vegetables, drying of fruits and vegetables, and the making of cottage cheese.

CONTESTS.

Two of the most valuable and interesting features of the Short Course were the Girls' Canning Club Contest for the Holland Trophy Cup, and the Boys' Stock Judging Contest for the Progressive Farmer Loving Cup.

SUPERVISION OF BOYS AND GIRLS.

A new plan was tried this year for the supervision of boys and girls. As soon as these young people reached College, they were divided into units of from eighteen to twenty, and each of these units was placed under the charge of a captain for the boys' and a counselor for the girls. I am pleased to report that, in spite of the fact that this was a new plan being tried for the first time, it gave splendid results.

ENTERTAINMENT.

The entertainments offered this year were of the usual high order. These consisted of moving pictures, singing, music, recitations, and the like.

FINANCIAL REPORT.

Name	Purpose Expended	Amount	Amount
Appropriation.....			\$ 1,500 00
Less deficit, 1918.....			274 98
			\$ 1,225 02
Farmers' Short Course Room Rent.....			984 50
Farmers' Congress Room Rent.....			374 50
Lease for cold drink stand.....			75 00
			\$ 2,659 02
W. Wipprecht.....	Stamps.....	\$ 15 00	
W. Wipprecht.....	Stamps.....	10 05	
W. Wipprecht.....	Stamps.....	20 00	
W. Wipprecht.....	Stamps.....	15 00	
Star Engraving Co.....	Short Course Bulletins.....	46 35	
Lawrence Grocery Co.....	Wrapping paper and twine.....	6 70	
Repair Sales.....	Prorata Airdome.....	100 00	
Pay roll.....	Covering cots.....	15 78	
Wells Fargo.....	C. O. D. charges on films.....	7 05	
Wells Fargo.....	C. O. D. charges on films.....	6 04	
Lawrence Grocery Co.....	Wrapping paper and twine.....	6 70	
Terrell Sledge.....	Two declamations.....	3 00	
Ruby Morris.....	Refund on room rent.....	1 25	
Pay roll.....	Nine Counselors.....	309 87	
Pay roll.....	Orphans' Band for one week.....	47 50	
Pay roll.....	Mrs. J. C. Williams (music).....	10 00	
Pay roll.....	Woman's Demonstrations.....	64 50	
Pay roll.....	Alderson and Whittaker Lectures.....	51 66	
J. A. Bexell.....	Refund room rent.....	1 00	
Pay roll.....	Registration, Rivera Orchestra, pianist, etc.....	189 25	
Robert Lindor.....	Refund room rent.....	1 00	
R. W. Welch.....	Refund room rent.....	1 00	
Lawrence Foote.....	Refund room rent.....	1 50	
E. J. Kyle.....	Gasoline and telegram to Falkner.....	2 90	
F. W. Hensel.....	Paste, soap, barley flour, etc.....	4 55	
H. C. Rutledge.....	Refund room rent.....	1 00	
O. E. Noah.....	Refund room rent.....	50	
Wittenberg-King Co.....	Fruit and vegetables.....	5 99	
Levy Brothers.....	Pillows.....	164 00	
Dr. A. C. Ellis.....	Refund room rent.....	6 00	
Wells Fargo.....	Carriage on fruit and vegetables.....	4 66	
Hogan-Allnoch Dry Goods Co.....	Towels.....	16 67	
American Dehydrating Co.....	Dehydrated fruit and vegetables.....	1 50	
Clemens Horst Co.....	Vegetables.....	2 05	
Texas Seed and Floral Co.....	Raffia.....	4 61	
Pay roll.....	Covering cots, janitor, water carriers, etc.....	75 25	
W. O. Youngblood.....	Ice.....	70 20	
Parker-Astin Hardware Co.....	Tacks.....	1 70	
Pay roll.....	Maids and janitors.....	127 95	
Wallace Printing Co.....	Posters, envelopes, signs, etc.....	153 25	
Eagle Printing Co.....	Bulletins, advertising, etc.....	329 90	
W. Wipprecht.....	Stamps.....	6 00	
T. A. Satterwhite.....	Rent on sewing machine.....	2 00	
E. R. Emmel.....	Amonia, etc.....	3 33	
Pay roll.....	Abe Hensarling (registration).....	11 00	

Name	Purpose Expended	Amount.	Amount
Bryan Telephone Co.....	Long distance calls (Kyle to Counselors, etc.).....	\$ 5 45	
Eugene Edge.....	Ducking.....	199 86	
Sam B. Wilson.....	Thimbles, towels, netting, etc.....	22 75	
Howell & Co.....	Soap.....	5 90	
Home Canner Co.....	Capping steel (girls' prize).....	4 04	
College News Dealer.....	Daily papers for one week.....	4 05	
Practical Drawing Co.....	Raffia, needles, paste, binders linen, etc.....	68 34	
Exchange Store.....	Towels and library paste.....	31 55	
John M. Caldwell.....	Engraving trophy cup, thimble.....	5 40	
Wells Fargo.....	Use of truck.....	41 50	
H. & T. C.....	Carriage on pillows.....	6 59	
Lawrence Grocery Co.....	Correction on bill for twine and paper.....	1 95	
Levy Brothers.....	Rent on cots and beds.....	18 00	
Cole & Hensarling.....	Tomatoes.....	5 40	
B. Sbisá.....	Seven extra suppers.....	7 00	
Leaffa Randall.....	Refund on railroad fare.....	2 88	
Pay roll.....	Hauling baggage, cleaning laboratory.....	5 00	
Elite Service Car Co.....	Mrs. Williams and Miss Mike to College.....	1 00	
Western Union Telegraph Co.....	Messages to Ousley and Babers.....	1 29	
R. D. Swisher Mfg. Co.....	Three hand stamps.....	65	
Army Training Con. No. 265.....	Repairing cots, canvas, etc.....	231 70	
Wiring account.....	Lamp cord, socket and plug.....	2 85	
Creamery sales.....	Milk.....	2 30	
Farm account.....	Milk.....	2 40	
Commissary account.....	Mexican Band, maids, Orphan Band, etc.....	230 99	
Repair sales.....	Five brass bibbs.....	6 25	
Laundry sales.....	Laundry.....	49 81	
Laundry sales.....	Laundry.....	29 37	
Horticultural account.....	Labor, man and team.....	10 50	
Horticultural account.....	Canning supplies, labor, team, fruits, etc.....	23 25	
Horticultural account.....	Paste, mimeograph paper, Imp. paper, etc.....	8 00	
Repair sales.....	Painting barrels.....	7 50	
Repair sales.....	Repairing Bizzell Hall toilet.....	1 00	
Wells Fargo.....	C. O. D. charges on films.....	23 33	
Wells Fargo.....	C. O. D. charges on films.....	6 09	
M. Falkner.....	Fifty per cent Farmers' Congress room rent.....	157 50	
Pay roll.....	Moving cots.....	20 00	
Wells Fargo.....	Express on prize pig.....	1 85	
Everfresh Food Co.....	Fruit and vegetables.....	1 88	
Dansby Furniture Co.....	Rent on 100 chairs.....	4 20	
Exp. Sta. Photo. Com.....	Plates and prints.....	1 31	
Myers Hardware Co.....	Scissors, dishes, rent on dishes, etc.....	24 60	
Cole Hardware Co.....	Tin cups and poster tacks.....	1 70	
Horticultural account.....	Labor, man and team.....	26 50	
L. C. Wilkinson.....	Room rent.....		\$ 1 50
Leaffa Randall.....	Railroad fare returned.....		2 88
Arym Training Con. No. 265.....	Refund on covering cots.....		74 92
Howell & Co.....	Refund on case of soap.....		5 90
Total credits and expenditures.....		\$ 3,231 99	\$ 2,744 22
Deficit Farmers' Short Course Fund, 1918-19.....			\$ 487 77

The financial report given above shows a deficiency of \$487.77.

A statement of the College Treasurer shows that on August 31, 1917, there was an unexpended balance in the Short Course fund of \$336.80 which was placed in the College Surplus Account by the Auditor. If the President will set apart an equivalent amount out of the surplus to be credited to the Short Course Fund it will leave a deficit of only \$150.97.

In considering the financial statement, I ask that you bear in mind the following expenditures which could hardly have been foreseen:

1. Prorata for building Airdome, \$100.00.

2. Purchase of pillows made necessary on account of the presence of soldiers, \$164.00.

3. Use of truck for bringing beds to and from Bryan in order to equip Bizzell Hall, \$41.50.

4. Purchase of canvas and tacks, and the making of four hundred cots which it was necessary to furnish the soldiers in order to have them vacate three of the dormitories, \$471.87.

Respectfully submitted,

E. J. KYLE,
Director, Farmers' Short Course.

REPORT OF FARMERS CONGRESS.

College Station, Texas, September 1, 1918.

W. B. Bizzell, President, A. and M. College, Campus.

DEAR SIR: As requested in your favor of recent date, I am handing you herewith a brief report of the Farmers' Congress, supplementary to the report on the Farmers' Short Course.

DATE AND PLACE OF MEETING.

The Twenty-first Annual Session of the Texas Farmers' Congress was held at College Station, July 29-31, 1918, immediately following the Farmers' Short Course.

ATTENDANCE.

The attendance was three hundred and fifteen, a slight increase over the previous years.

MEETINGS.

On Monday and Tuesday evenings and Wednesday morning general meetings were held in the Airdome where agricultural subjects of general importance were discussed. On Monday and Tuesday afternoons the various organizations meeting at the Congress held their sectional meetings.

The attendance at these meetings, and the interest taken in them, considering the size of the crowd, were very good.

In order to help relieve the serious financial conditions of the Congress the members attending were charged a registration fee of \$1.00 per day, and fifty per cent of that amount was turned over to the secretary-treasurer of the Congress. The treasurer has just reported to me that there is still a considerable deficit.

He also reported to me that he has written the President, Mr. Fritz Englehard, a number of times in regard to the financial conditions of the Congress and other matters pertaining to the welfare of the organization, but so far has failed to receive a reply.

PROCEEDINGS.

The College paid for the printing of the 1917 proceedings, as has been the custom for the past three years. The proceedings contained a number of excellent photographs, and were easily the best that have ever been published. There were two thousand copies printed at a cost of \$727.90. I have recently discussed with the secretary-treasurer the advisability of continuing the printing of these proceedings. He agrees with me that on account of the fact that so few people read the proceedings, and on account of the fact that there is not much interest taken in the Congress, especially by its President, that it is doubtful if it will pay to print the proceedings. I do not care, however, to make any recommendations in regard to this matter.

Respectfully submitted,

E. J. KYLE.

REPORT OF Y. M. C. A. SECRETARY.

September 1, 1918.

President W. B. Bizzell, College Station, Texas.

DR. BIZZELL: I wish to submit to you a report of the religious activities of the Y. M. C. A. of A. and M. College, College Station, Texas, for the year ending September, 1918.

This has been an unusual year in Y. M. C. A. work, due to the many complications that have arisen. Many of the strongest college men and religious workers entered the army service early in the college year. Thus a well organized plan was interfered with. But through it all the Y had a successful year. Special efforts were made at the opening of the College to secure a large enrollment in Bible study and membership in the Y. M. C. A. with the result that 550 enrolled in Bible study and 450 in the Y. M. C. A. Every Sunday morning during the College year Bible study and preaching services were maintained, also every Sunday evening the Y had its particular service and every Tuesday night prayer services were conducted by the students.

The social side of the student was not lost sight of. Through the different Bible classes and the Y a number of socials were held that proved to be worth while to the young men who participated.

While all the plans made to assist the students were not fulfilled, I feel that a great deal was accomplished. In addition to the above, a large number of students were given counsel that resulted in good. Through these efforts a number of students who were discouraged, down in their work and about to leave College, were able to make good and finish their course.

The following will give some results for the past two years:

	1916-17	1917-18
College enrollment	1242	1156
Number of church members in College.....	833	746
Students in the Y. M. C. A.....	326	450
Students enrolled in Bible study.....	400	550
Leaders of Bible classes.....	22	25
Students attending prayer meeting.....	0	50
Students making confession of Christ.....	90	150

In brief, the above is an outline of the work accomplished by your secretaries and advisors.

Trusting the above will meet your approval.

CHAS. FIRTH,
Secretary.

REPORT OF DIRECTOR OF WAR EDUCATIONAL ACTIVITIES.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: I beg to make the following report of the war activities of the College during the past two years.

Since its opening the College has required its students to take certain military instruction, and what is perhaps more important, has kept its students under military discipline. This training, together with the military atmosphere which existed at the College, probably accounts for the large number of graduates and former students who are among the officers in the army.

When it seemed that the United States must inevitably enter the war, the Faculty, on March 21, 1917, unanimously passed the following resolution:

WHEREAS, The President and the Congress of the United States are confronted with a serious international crisis that may at any time result in a declaration of war; and

WHEREAS, The Agricultural and Mechanical College of Texas is a land-grant institution established by an act of Congress in 1862 presumably for the purpose of preparing men for military service and technical pursuits; and

WHEREAS, The conditions of modern warfare demand technically trained men for military service; therefore, be it

Resolved, That we, the Faculty of the Agricultural and Mechanical College of Texas, earnestly request the immediate approval of the Board of Directors, sanctioned if necessary by the Legislature of the State, for the tender to the Federal government of all research and instructional facilities at this College, the same to be subject to the direction of the Secretaries of War and Navy, and that we hereby, individually and collectively, pledge our support to the international policies of the Federal government and earnestly request the Governor and the Legislature of this State to assure undiminished the continuït of appropriations during the continuance of such Federal use irrespective of the suspension of the instructional functions of any or all the College departments. We urge the favorable consideration of this resolution by the Board of Directors of the College and if necessary by the Legislature also.

At its next meeting on March 23, 1917, the Board of Directors approved the resolution as submitted by the Faculty, and the facilities of the College was tendered the government.

On April 7, 1917, the day after war was declared, the amount of time devoted to military instruction was increased to ten hours per week, besides a material increase in the time devoted to target practice.

On April 26, 1917, following a communication from General John J. Pershing, at that time commanding general of the Southern Department, the Faculty adopted a resolution urging all students to remain

in College and prepare themselves for more effective service when called to enter the military establishment.

On the same date the Faculty decided to recommend for graduation on May 3rd, seniors whose class standing was satisfactory and who were to enter the army or the navy through the first officers' training camp or in some other manner.

The President, at the request of the Faculty, appointed a committee on organization for national defense, whose duty it was to act on behalf of the College in all questions pertaining to the matter of national defense. This committee was also charged with the duty of acting as a committee on research for the purpose of coordinating the research activities of the College in so far as they might have a bearing on problems of national defense.

The committee consisted of Dr. W. B. Bizzell, chairman; Dean Charles Puryear, Dr. O. M. Ball, Director Clarence Ousley, Mr. H. M. Eliot, Director B. Youngblood, Dr. E. P. Humbert, secretary, and Professor F. C. Bolton.

The following extract from the report of Dr. E. P. Humbert, the secretary, indicates what the committee accomplished:

"The committee has remained unchanged except that Mr. T. O. Walton was asked to act for Colonel Ousley when the latter was called by President Woodrow Wilson to serve as Assistant Secretary of Agriculture of the United States.

The committee has furnished the authorities at Washington with the information which they have required from time to time concerning the College, its Faculty and student body. Through the efforts of the committee several members of the Faculty volunteered to work during the summer months for the National Committee on Defense. One man, Dr. A. B. Ray, of the Department of Chemistry, volunteered his services without pay and was accepted to do research on gas. Dr. Ray's position was later made permanent and a suitable salary provided.

The committee decided after an investigation that very few, if any, changes would have to be made in the existing research projects of the institution to fit them to the changed conditions due to the war. This was due largely to the fact that the research work of the College is in close cooperation with Federal bureaus.

A subcommittee of this organization fostered the war garden movement among the College people with considerable success.

Several hundred bulletins and placards of the State and Federal food administrations were distributed through the committee in an effort to have all private kitchens and public eating houses on the campus strictly observe the orders. The heartiest cooperation was found among all College people in this regard.

The committee arranged to have thrift stamps and war savings stamps put on sale in various buildings on the campus."

On December 9, 1917, after some preliminary correspondence, a detachment of 112 men of Depot Company "K," Signal Corps, was sent to the College for training in the technical features of signal corps work. This detachment was commanded by Lieutenant (now captain) M. C. Funston, and the medical attention was given by Lieutenant Brooks G.

Grant. The course consisted largely of technical instruction which was given in the Department of Electrical Engineering by the department staff. The military instruction was given by the military officers. About two-thirds of the membership of this detachment was recruited from the College students. At about the same time the Department of Electrical Engineering offered a course in buzzer practice for young men of draft age who wished to prepare for the signal corps. A number of young men started the course and all entered the signal corps in a short time.

At the beginning of the second term of the session of 1917-18, the signal corps requested the College to offer a course in radio communication to junior and senior electrical engineering students and other engineering seniors. The course was offered in the electrical engineering department as an option and was elected by practically all the eligible students. After taking the course the men were eligible to the signal officers' training camp, and several of them entered the service in this way.

On April 26, 1917, the President, on motion made in the Faculty, appointed a committee consisting of Professors F. C. Bolton, Charles Puryear and R. A. Andree to determine what the College could do to aid in the re-education of wounded soldiers and sailors. Supervision of this matter is in the hands of the Federal Board for Vocational Education and the facilities of the College have been offered for this work. At present there seems to be little likelihood of this work assuming large proportions.

In January the War Department began to make plans for utilizing the Colleges more extensively in training men for the technical branches of the army, and on January 11 and 12, 1918, the writer represented the College at a meeting of representatives of the various colleges and universities of the country, which was held in Washington, to discuss plans for the training of mechanics and technicians.

The preliminary steps in the organization of the colleges for this work were taken by the Federal Board for Vocational Education. Later the Committee on Education and Special Training was organized as a committee of the general staff to have supervision over the technical instruction of men for various branches of the army.

This committee had for its district educational director in this district, Mr. H. C. Givens. His duty was to advise with the colleges in the educational work for the vocational or Section B men.

On April 1, 1918, the course which was being given to the signal corps men was modified and about 300 men came in for training as radia mechanics for the air service. As men completed their training they were replaced by others, and the detachment was gradually increased in size.

About August 1, 1918, the course of instruction was again modified and the men reporting after that date were trained as radio electricians for the signal corps. This course has continued to the present, and men are now being trained in this work in a course which continues for thirteen weeks.

The radio and signal corps work is given in the Department of Electrical Engineering under the immediate supervision of the undersigned and Associate Professor O. B. Wooten, and with the assistance of other members of the department, men from other departments and additional instructors employed for the purpose.

The equipment of the Department of Electrical Engineering was supplemented by a large amount of radio equipment, the property of the signal corps. The work was given largely in the Electrical Engineering building, though the stock judging pavilion was used for housing airplanes.

When the training of radio men was taken under the direct supervision of the Committee on Education and Special Training, as is noted below, two signal corps officers were detailed to advise with the College authorities relative to the details of course of instruction and to assume responsibility for the equipment. Lieutenants J. B. Joyce and E. T. Hagan was detailed for this purpose. These officers were relieved by Lieutenants A. V. Roberts and R. E. Crittenden.

On April 15, 1918, a detachment of 369 men reached College for training as auto mechanics, machinists and blacksmiths. This detachment was known as Texas A. and M. College Training Detachment and was under the command of Captain (now major) Fred W. Zeller, who was assisted by five other infantry officers and one medical officer. These men completed their courses in two months and have been succeeded by larger detachments at each two-month period. In addition to the trades mentioned above, men have been trained as carpenters, horseshoers, surveyors, topographical draftsmen, general mechanics and pipe fitters and part of the next detachment are to be trained as farriers.

The work of the auto mechanics has been given by the Department of Agricultural Engineering, under the immediate direction of Professor R. A. Andree. Part of the work has been given in the stock judging pavilion and part in a temporary frame building 250 feet by 100 feet, erected for the purpose. The War Department has provided about twenty-five trucks for instruction in driving, and a large number of automobiles, gas engines and other equipment of various kinds have been purchased for instructional use.

The instruction for blacksmiths, horseshoers, machinists, general mechanics and pipe fitters was given in the Department of Mechanical Engineering under the supervision of Professor E. J. Fermier. This work has been given in the Mechanical Shop building, but a frame building is now being erected to house the forge work.

The work of the surveyors and topographical draftsmen is being given under the supervision of Dean J. C. Nagle of the Civil Engineering Department, assisted by Professor A. C. Love, while the course for farriers is to be given in the School of Veterinary Medicine.

The instruction of the men under training as carpenters was supervised by Mr. W. W. Kraft, superintendent of buildings and grounds, and the men were given practical instruction on the barracks and other buildings being constructed in addition to their theoretical instruction in class rooms.

On May 24, 1918, the Signal Corps School of Meteorology was established here. Dr. O. L. Fassig of the Weather Bureau was detailed by the War Department to supervise the instruction, all of which was given by government employes. This work was concentrated in the Civil Engineering building. About 400 men have been trained in this school to date. This is the only school among the allied nations for the training of meteorologists for the military service.

A total of 3648 soldiers have been trained in the various courses prescribed by the government.

The courses in which they were trained are as follows:

Auto mechanics	1731
Signal corps and radio.....	1305
Machinists	82
Horseshoers	30
Blacksmiths	56
Carpenters	82
General mechanics	6
Surveyors	12
Topographical draftsmen	6

While a majority of these men came from Texas, many came from other States. It has been a means of making the work of the College known throughout the country.

The problem of obtaining instructors has been a serious one, as at times as many as eighty instructors were required. So far as possible teachers from other departments were used. Other men from various parts of the country were employed and all were given special courses of instruction in the courses which were to be taught. The patriotic spirit of the teachers is to be commended. Professors and teachers of all ranks entered into the work and exerted every effort to make it a success regardless of what their positions in the regular College organization may be. Many of the teachers who were brought to the College had been practical men, and they came here at financial sacrifices in many cases because they felt they were performing a patriotic duty. These men were given instruction in methods of teaching which aided them in handling the work, and I believe there is no question of the success of their work.

Some of the instructors who were placed in class one of the draft were inducted into the service and furloughed to act as instructors. Later these men were called to active duty and assigned to the detachment here, but were still allowed to act as instructors.

In addition to the civilian instructors a certain number of soldiers were selected from each detachment and retained as assistant instructors. These men were also given training in methods of teaching. Many of these were afterwards selected for officers training camps, where they found their experience as teachers of much value to them.

The courses of instruction have been intensive short courses and the classes have been handled with the idea that every man must be made to get the most possible out of this course. There was none of the spirit of offering the course and allowing the man to take it or not

as he chose, but the problem was approached with the idea that the government expected every man to be trained as fully as possible.

The work of the men is extremely practical and only such lectures are given from time to time as were necessary to an understanding of the work. From the nature of the work the radio courses require considerably more theory than is required for the other courses.

When the courses were inaugurated eight hours per day for five and one-half days a week were devoted to class and shop work, while one hour per day was devoted to drill. Under orders from the Committee on Education and Special Training the time for technical instruction was reduced to seven and then six hours per day, while the time for drill was increased to two and then three hours per day.

It is believed that the courses here and elsewhere have demonstrated the possibilities of short intensive trade courses.

When Signal Corps Depot Company "K" came for training, a medical officer was on duty with the troops, and he was allowed the use of part of the College Infirmary. As the number of soldiers increased it became evident that the Infirmary would not be large enough to accommodate soldiers and students with the opening of College in September.

In May, 1918, the matter of additional hospital facilities was taken up with the department surgeon of the Southern Department. Assurances were given that a building would be erected, but one thing after another delayed the matter, and it was only after a personal trip to Washington by President Bizzell that a hospital was finally authorized.

The men under training were quartered in the dormitories at first, but as the number of troops increased, and with the approach of the opening of College, standard cantonment type barracks were constructed. A total of nine of these buildings, each 140x42 feet, and two stories high, were erected.

The Y. M. C. A. has been actively engaged in attending to the entertainment and the spiritual welfare of the soldiers. Mr. Firth, the College secretary, has been assisted by several army Y. M. C. A. men. The outdoor pavilion has been used for motion pictures and other entertainment, and the Y. M. C. A. building is the center of the social life of the soldiers as well as students.

A frame annex seating about 1300 men has been added to the Mess Hall in order that meals might be served the soldiers and the students at the same time. Much additional work has been necessary in the kitchen in order to serve meals for such numbers.

One of the requirements of the War Department was that they be allowed to have a canteen. In order that this might be kept under the supervision of the College a frame building was erected to house the canteen, which is under the management of Mr. R. K. Chatham. The canteen pays a percentage of the income to the company fund of the soldiers.

Many of the soldiers stationed here were married and their wives followed them. In order to make their stay as pleasant as possible the old hospital was fitted up as a dormitory for soldiers' wives and it has been fully occupied. During part of August and September, Milner

Hall was used as a women's dormitory for the accommodation of the wives of enlisted men.

The housing, subsisting and instructing of so many men at a time required the construction of many buildings. These were built under the supervision of Mr. W. W. Kraft, superintendent of buildings and grounds.

Owing to the scarcity of labor and the slow delivery of building material it was deemed best to have this done by the Department of Buildings and Grounds rather than to let contracts.

The following buildings have been constructed for use of the soldiers: Two quartermaster buildings, nine barracks, one auto machanic building, one forge shop, one instructors' quarters, one officers quarters, one mess hall annex, one mess hall servants' quarters, one canteen, one storage battery building, one carpenter shop.

The following were authorized but had not been constructed when all construction work was stopped: One guard house, one new hospital, one instructional building.

The difference between the cost of these buildings and their depreciated value is to be paid by the government.

In giving this institution for the War Department it has been the policy not to profiteer on the government, but do the work at as low a cost as possible and to charge the government only enough to insure the College against loss.

While it might have been possible to erect more permanent buildings it does not seem to be proper to build up the plant of the College at the expense of the government when less permanent construction would answer the needs at a much lower expense.

The present contract contains a clause giving the government auditors the right to examine the accounts and readjust the rate so that the work will be done at cost.

On July 15, 1918, the War Department's committee very wisely inaugurated the policy of giving a series of lectures on the purposes and aims of the allied governments. These lectures are given one hour per week to each man. The men are handled in groups of about fifty and the work is followed up by visits made by the lecturers to the men in their quarters where questions bearing upon the subject matter of the lectures are discussed informally. These lectures seem to be very much appreciated by the men.

Dr. D. C. Hull, assisted by Mr. C. E. Friley, organized the work, but after a short time Dr Hull was obliged to return to his former position and Prof. W. M. W. Splawn was engaged for the work for about a month. Later, Mr. J. F. McDonald was engaged as director of War Aims courses and this work is now under his supervision.

Section A is the unit composed of men having the regular College entrance requirements and doing work of a College grade. These men are divided into an army section and a navy section, the latter of which is commanded by a naval officer. While Lieutenant Walter K. Setzer commands the Army Section A. Both Sections A and B were commanded by Major Fred W. Zeller and later by Major Grant M. Miles.

For record a list of the military officers detailed here is attached.

While practically every member of the College organization has assisted in some way in the work of training the men the attached sheet contains a list of those who have been most directly connected arranged to give some idea of the organization.

The work of the College in training men for the technical branches of the army has received favorable mention from the representatives of the War Department and I believe good work has been done. Candidly, I had no idea that men could be so well trained by so short a period of intensive training.

I do not believe the College should allow the experience gained in this work to be wasted, but should continue to train men in vocational work, giving intensive short courses. In the light of the experience with these courses I believe that the engineering short courses which have heretofore been offered could be improved in a number of ways.

1. There should not be a break in the work by the usual summer vacation, but the work should continue through as many consecutive months as are necessary.

2. It should be recognized that these men have not the same mental development and the same incentive that more advanced College students are supposed to have and the instructor should make greater effort to teach the student rather than leaving the student to get the instruction if he wishes.

3. For the short courses practically all the instruction for a given set of men should be given in the same department. The plan of having a student take work in a number of departments from several different men is good for College students, but it is better to have the work more correlated for the short course men.

4. Our short courses have had too large a portion of theory.

Yours very truly,

F. C. BOLTON,

Director, War Educational Activities.

REPORT OF PUBLICITY DEPARTMENT.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: In compliance with your request for a report upon the work of the Publicity Department for the biennium now closing, I am glad to transmit to you herewith a summary of the work of that department for the past twelve months, this being the extent of my connection with the department and finding no permanent record of the work during the preceding year when the office was only temporarily filled.

The work of the Publicity Department proper has been broadened considerably during the past year, the Publicity Secretary having gone out on several projects fostered by the Extension Service of the College and of the Texas Agricultural Experiment Station and, procuring his data first hand, along with photographs, has been able to secure the publication of illustrated articles in the daily papers of the State on the work these departments of the College are doing in the promotion of increased food and feed production, food and feed conservation, better farming methods and of better educational and social opportunities in the remote rural precincts.

In view of the fact that the small newspapers of the State are unable to handle much news from the College where they are expected to do the original composition on such articles, the Publicity Department has made arrangements with a well established plate manufacturing concern to distribute plated news and feature articles concerning the work of the College with one hundred small dailies and leading weekly and semi-weekly papers, representing practically every section of the State, and I believe a great deal of valuable publicity and propaganda for the College can be procured in this way which has never been obtained before.

This larger work of the Publicity Department will entail a larger expense than has been incurred before, however, and I would suggest that the Legislature be requested to make the annual appropriation for this department \$1500 instead of \$1000, the sum appropriated for each year of the closing biennium.

The College print shop, which comes under the direction of this department, has made considerable progress during the past year. Its very scant equipment has been enhanced by the addition of a new Model 14 Linotype machine at a cost of \$3350, a competent foreman has been employed, and the shop has been moved from the basement of the academic building to the southeast corner of the textile engineering building. This new location, while a great improvement upon the former one, must be regarded as only temporary, however, as the space now taken by the print shop will be needed again when the textile department enters upon a more active post-war basis, and the room now occupied by the print shop is wholly inadequate if that institution is to grow.

And there is every reason why it should grow. Enough job work originates on the campus to keep a large force of men and a vast amount of machinery busy and economy of means, time and labor could be effected by this work being done on the campus where the cost of transportation and many other overhead expenses could be eliminated entirely.

At present, the print shop furnishes more work than one man can do, but not enough to justify the employment of an additional man for full time, but with the addition of a large and small job press—releasing the present press for the publication of *The Reveille*, the daily paper published by the Publicity Department—enough additional work could be taken in to justify the employment of additional help, and sufficient additional revenue accrue to the shop to take care of the outlay in this increased salary and equipment.

I recognize that the print shop should be enlarged gradually as the demand upon it grows, but to keep it growing as it ought the shop should to have an annual appropriation of at least \$4000 for the next two years.

When the present Publicity Secretary came to College a year ago *The Daily Bulletin*—then the official publication of the College—was a very poorly printed paper, set by hand with old, worn-out type. Gradually its size has been enlarged and its appearance improved until with the installation of the new linotype machine, the purchase of a little additional display type for large heads and advertisements, and the change in the name of the paper to *The Reveille*, it compares favorably, in mechanical appearance at least, with any publication in the State.

The Publicity Department of the College has also furnished almost daily news budgets and telegraphic dispatches concerning various campus events and college activities to the leading daily papers of the State, and many of these items have been published in spite of the claim of the war news upon these papers and the government orders for the decreased consumption of white news print paper.

Respectfully submitted,

FRANK E. BURKHALTER,
Publicity Secretary.

REPORT OF LIBRARIAN.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: I herewith submit the biennial report of the Library for the years 1916-17 and 1917-18.

The number of volumes in the Library has almost doubled in this time, from approximately 6200 to 11,550. About 500 of these are bound periodicals, which greatly help our reference facilities. The Library receives over 150 magazines and periodicals, besides all of the principle newspapers of the State, and a few of the more important ones from the large cities of the country.

During the year 1916-17 the increased use of the Librarry took up so much time, that the cataloging fell behind and the next year an assistant was engaged. She left at the end of the year to accept another position. During the year 1917-18 the book room became so crowded that seven additional double tier stacks were added at a cost of \$917, which will accommodate about 6000 additional books.

It was hoped that on account of the crowded condition of the Library, that during the year 1917-18 the old chapel could be made over into a library, and \$6000 was appropriated by the Legislature for this purpose. This building, however, was considered unsafe for such purposes. Therefore the great need of the Library, in spite of the additional stacks, is more room. These stacks took up room where there were formerly tables, at times there is now scarcely room for everybody to study.

We cannot do full justice to ourselves or to the patrons of the Library until we can get room for our government documents. As a College libraary, which ought to be chiefly a reference library, we need them badly in a convenient place where we can get hold of them quickly and easily, without digging for them, not to speak of those which we have on the campus, but which are not available through lack of room. We could avoid many inter-library loans which we are compelled to make for documents which would be on our shelves had we more room.

I understand an Administration building is planned for the near future to be situated opposite the Y. M. C. A. Why not combine this with a Library building?

Respectfully submitted,

W. N. DANIELLS,
Librarian.

REPORT OF SUPERINTENDENT OF BUILDINGS AND GROUNDS.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: Herewith please find the report of the improvements on the campus from September 1, 1916, to September 1, 1918, as properly come under the direction of the Superintendent of Buildings and Grounds. Many small items of repairs, such as maintenance, charges to buildings, water lines, steam lines and sewer lines, are not listed.

BACHELOR HALL.

This building was remodeled and arranged for four apartments at a cost of \$7989.46.

DORMITORIES.

During the period \$2790.16 was spent on improving dormitories by painting inside, also the following dormitory roofs were painted: Ross Hall, Austin Hall and Pfeuffer Hall.

FENCE.

A new ornamental woven wire fence was built along the College-Bryan road from Kyle Field to 334 feet north of I. & G. N. spur, length of fence, 1483 feet, and cost \$1912.51.

FIRE PROTECTION.

During the past year \$1191.00 was spent on a new water main, with fire connections in Ireland Street from the laundry to the county road, a distance of approximately 600 feet.

Foster Hall was equipped with a fire escape constructed in accordance with State fire laws at a cost of \$650.00.

A 60-gallon capacity double tank automobile fire engine with complete equipment was purchased at a cost of \$1147.43. In addition, we have added fifty 2-gallon fire extinguishers to our equipment, also a supply of charges for our fire extinguishers at a cost of \$650.00.

GATHRIGHT HALL.

The front end of Gathright Hall was given a stucco finish and a new entrance was built at a cost of \$434.25.

HOSPITAL FLOORS.

Composition floors were constructed in the hallways of the new hospital by contract with the Wearcote Engineering Company for \$1356.25.

MOVING RESIDENCES.

A number of residences have had to be moved to new locations to

make room for Guion Hall and the opening of new streets. The following residences were moved, foundations and brick work restored, at a total cost of \$2329.08. Residences 211-202-233-404.

NEW RESIDENCES.

The following new residences were constructed during the period: Residences Nos. 203-204-209-212-214-218-231-415, at a total cost of \$24,919.52. All of these residences are of the same size and general plan, except residence No. 209, which is a 2-story frame house, known as the Commandant's residence.

SEWERS.

A storm sewer was constructed to care for the storm water from the new hospital at a cost of \$59.45. Also, a storm sewer to care for the following buildings: Academic building, Civil Engineering building, Electrical Engineering building, Ross Hall and Foster Hall, as a cost of \$140.60.

A sewer was constructed to serve the new Hog Serum Laboratory at a cost of \$460.40.

A sewer was constructed to serve the Y. M. C. A. building at a cost of \$980.99.

The plans and specifications were drawn up for a 10-inch sewer main running from the manhole in front of the President's house, north to the rear of the Mess Hall, thence east and southeast to the new sewage disposal plant. The new sewer is about completed at the present time at a cost of approximately \$1900.00. In this connection I wish to mention the new sewage disposal plant, which is of the latest and best design and will cost approximately \$11,000.00.

SIDEWALKS AND GRADING.

Sidewalks around the new hospital, out to and along the road in front of the hospital, with grading and leveling of grounds was all completed during the period at a cost of \$2865.07.

Sidewalks in front of Academic building, from Academic building to Civil Engineering building and Electrical Engineering building to the Military Walk and along Military Walk from Ross Hall to the Assembly Hall, with all necessary grading and leveling up, were built at a cost of \$3743.21.

STEAM LINE.

A steam line was built from the Mess Hall main to the new hospital, with proper insulation, a distance of approximately 500 feet at a cost of \$1640.71.

A new high pressure steam main was constructed in the tunnel from the steam plant to the Assembly Hall. This line is to serve the Mess Hall, Hospital, President's house, Civil Engineering building, Y. M. C. A., Goodwin Hall, Bizzell Hall, Guion Hall and showers for all dormitories. The line is made up as follows: 630 feet of 5-inch pipe, 1214 feet of 4-inch, 200 feet of 3-inch and 400 feet of 2½-inch pipe. The total cost of this line was \$6034.00.

A high pressure steam line was constructed in Roberts Street from the main in the rear of the Academic building to the incinerator. This line serves the Chemistry building, Textile building, Frances Hall, Agricultural Engineering building, Veterinary Hospital, Hog Serum Laboratory and the incinerator. The length of the line is 2080 feet and the cost was \$3675.00.

TUNNEL.

The utilities tunnel was extended from Ross Hall to the Assembly Hall at a total cost of \$7442.81. This tunnel was constructed along the same design as the tunnel from the steam plant to Ross Hall.

Y. M. C. A. BUILDING.

The basement of the Y. M. C. A. building was finished which included the swimming pool, dressing rooms, shower baths, heating, tile floors in both ends of basement under the half-circle terraces, at a total cost of \$10,485.52.

Y. M. C. A. RESIDENCE.

A 5-room frame residence was built for the Secretary of the College Y. M. C. A. at a total cost of \$1950.00. The cost of this residence was paid out of local funds of the Y. M. C. A.

Respectfully submitted,

WALTER W. KRAFT,
Superintendent of Buildings and Grounds.

REPORT OF STATE CHEMIST.

September 1, 1918.

President W. B. Bizzell, College Station, Texas.

DEAR SIR: In accordance with your request, I respectfully submit the following report for the two years ending August 31, 1918:

The fertilizer sales for the season of 1916-17 were 40,000 tons, and for 1917-18, were estimated as 58,000 tons.

The director of the Experiment Station pays the State Chemist \$6000 for the analysis of 1500 samples of feeding stuffs for the Feed Control Service, and \$3.00 additional for each sample above 1500. The money is used entirely for the expenses of the work.

During the season ending August 31, 1917, 1414 samples were analyzed for the Feed Control Service and 406 samples for the Fertilizer Control. During the season ending August 31, 1918, 1882 samples were analyzed for the Feed Control Service and 407 samples for the purpose of the Fertilizer Control.

Under the agreement fixing prices of cottonseed meal in Texas by the Food Administrator, made in November, 1917, this department was called in to make protein analyses of 2886 samples of cottonseed meal or cake. Many of these samples represented goods seized by the government. The Feed Control Service paid \$1.00 per sample for expense.

We also analyzed 218 samples of cottonseed for protein, fat and oil, for the Cotton Inheritance project of the Experiment Station.

The results of the fertilizer analyses are published in Bulletins 217 and 233 of the Experiment Station, and the results of the feed analyses in Bulletins 216 and 234. In connection with the above, it is necessary that we investigate the adulteration feeding stuffs, their composition, methods of detecting adulteration, for the Feed Control Service, and the composition, properties, and agricultural value of fertilizers, or ingredients of fertilizers, and conduct experiments in connection with the Fertilizer Control.

The department has been hampered by serious changes in the staff, due to war conditions, but it is gratifying to report that the work required was done, including an increased amount due to war work. On account of the scarcity of chemists, and the need of them for purposes of war, it was decided to train women to do this work, and this is being done, resulting in release of men for war service. There are now six women working in the laboratory and three men, but this includes the Experiment Station as well as the State work.

A financial report is attached. All vouchers were handled in the usual way through the Fiscal Department. The department has a respectable working balance, but the income of the department should provide a sufficient working balance to safeguard the needs of the department in case of a sudden decrease in fertilizer sales, as occurred

when the war first broke out. The department will also need considerable new equipment, as much of our material, practically worn out, we did not get replaced on account of the war.

Very respectfully submitted,

G. S. FRAPS,
State Chemist.

FINANCIAL STATEMENT.

Analysis Fund.

	1916-17.	1917-18.
Working balance	\$ 69 69	\$ 344 10
Received from Feed Control.....	6,000 00	8,844 00
Total	\$ 6,069 61	\$ 9,228 10
Expenditures	5,725 51	7,139 98
Working balance	\$ 344 10	\$ 2,089 12

Chemical Treasury.

	1916-17.	1917-18.
Working balance	\$ 2,376 96	\$ 4,838 97
Received from tag sales.....	10,191 00	14,893 75
Miscellaneous receipts	283 00	693 49
Total	\$12,850 96	\$20,426 21
Expenditures	8,011 99	7,938 24
Working balance	\$ 4,838 97	\$12,487 97

G. S. FRAPS.
State Chemist.

REPORT OF STATE FORESTER.

September 1, 1918.

President W. B. Bizzell, Campus.

DEAR SIR: In accordance with your request, I am pleased to hand you herewith the report of the State Forester of Texas for the biennium of 1916-17, 1917-18.

The forestry work has progressed steadily and the results achieved have, on the whole, been gratifying. The activities of the office have been along the lines of investigative work throughout the State, experiments in connection with the substations of the Texas Agricultural Experiment Station, forest fire prevention in the more important timber-producing and grazing sections of the East Texas timber belt, instruction in forestry at the Agricultural and Mechanical College, publicity work through the press and by special publications of the office, and correspondence with an increasingly large number of Texas citizens.

FORESTRY INVESTIGATIONS.

Special studies have been conducted as follows:

General survey of forest resources of the State.

Occurrence and commercial importance of cedar and mesquite.

Farm forest management and marketing.

Survey of forty counties in the East Texas timber belt.

The greater part of this work was too extensive for the office to carry into great detail, but was sufficiently comprehensive to furnish a valuable foundation for further investigations. The data gathered were prepared and published as Bulletin 3, "General Survey of Texas Woodlands, Including a Study of the Commercial Possibilities of Mesquite"; Bulletin 4, "Forest Resources of Eastern Texas"; and "Farm Forestry," a bulletin published in co-operation with the Extension Service. A bulletin dealing with the Cedar Industry of Central Texas is being prepared for the press.

FORESTRY EXPERIMENTS.

At several of the substations of the Texas Agricultural Experiment Station, projects were started with seeds and seedlings of forest and ornamental trees in the year 1916. Although the work was attended with some setbacks incident to the difficult weather conditions and problems of personnel, considerable progress has been made. Beginning with the fiscal year 1917-18, additional funds from the Experiment Station appropriation were made available and the work under the Division of Forestry given renewed impetus. Experiments were initiated at some additional stations, and the work at the other stations was expanded according to the apparent possibilities of the respective localities. So much additional work was begun at the Lubbock and Spur substations, where planting of the treeless areas is a most pressing problem, that a specialist was co-operatively employed to spend a part of his time caring for the forestry work at those stations.

FOREST FIRE PREVENTION.

The contract entered into with the Secretary of Agriculture through the United States Service in April, 1916, has been continued with remarkable success in spite of a restricting lack of funds and the small area where the money available makes the work possible. Even with the extremely adverse conditions caused by one of the most extensive and severe drouths which has ever visited the State, the damage caused by forest fires occurring within the patrolled area has been markedly reduced. In 1916 over \$1,000,000.00 of damage was suffered on account of fires; in 1917 the figure for the same region was slightly less than \$400,000.00, and during the present calendar year the total damage has not reached the \$200,000.00 mark. It would appear to be a safe deduction that the patrol work has stimulated a proper public sentiment against burning, and in favor of extinguishing every fire that occurs. Further evidence of this increasing sentiment is given in the passing of favorable resolutions by some of the county commissioners courts, the offering of a fifty-dollar reward for the arrest and conviction of violators of the State forest fire laws in one county, and the receipt by the Office of State Forester of many letters from East Texas citizens commending the work. One striking example of the value of the work was in the preservation of the forage on the open range for the use of cattle from the areas in Central and West Texas made barren by the drouth.

INSTRUCTION IN FORESTRY.

During the past two years the Department of Forestry of the Agricultural and Mechanical College has conducted five courses and two courses, respectively, enrolling in all about ninety students. These courses have given the students a general idea of forestry as a practice and have laid particular stress upon the forestry problems met with in Texas.

PUBLICITY WORK.

Additional education work has been carried on by means of articles spread broadcast through the press of the State on such forestry questions as are of immediate interest and importance. Much space was given to the wood fuel problem in an effort to increase the use of wood for the purpose of saving coal. Several items dealing with the general and special problems in the farm forest were given wide distribution. Many articles treating with the forest fire problem were furnished to the weekly press, and some of the larger dailies which circulate in the timber belt.

In addition to the bulletins mentioned earlier, the office has published the following:

Bulletin 4, "First Annual Report of the State Forester."

Bulletin 6, "Forest Fire Prevention in Cooperation with the Federal Government."

Bulletin 8, "Second Annual Report of the State Forester."

Unnumbered leaflet, "Wood as Emergency Fuel."

These publications were given a very wide distribution, and their value seems to be well evidenced by the large number of additions con-

stantly being made to the mailing list as the result of special requests for forestry literature.

The publicity given by press items and bulletins is being supplemented from time to time by addresses before meetings of various types. Twenty county teachers' institutes have been addressed, and members of the Staff have been included in the programs of the Texas Forestry Association, the State Federation of Women's Clubs, press associations, the cut-over land conferences, a conference of Southern foresters, and other similar gatherings.

Important educational work was done at the two State fairs held at Dallas during the biennium, and at the Cotton Palace Fair at Waco in the fall of 1917. Hundreds of people paid careful and interested attention to the exhibits, and a large amount of propagandistic work was accomplished by that means. A very complete exhibit was set up during the farmers' short course at College Station both years and proved to be an interesting attraction.

CORRESPONDENCE AND ROUTINE.

The increasing amount of correspondence and other office work made necessary the employment of a stenographer early in the first year of the biennium. The office correspondence during the year ending August 31, 1918, was more than double that handled during the previous year. The reports on forest fires submitted by the patrolmen are carefully compiled so that decreases in damage, etc., as the result of our fire prevention may be determined. A large poster urging the use of wood for fuel was designed and 3000 copies distributed in cooperation with the Extension Service and the Federal Fuel Administrator for Texas. In addition the State Forester, at the request of the Federal government, acted as recruiting agent for the Tenth and Twentieth Engineers, the two forestry regiments now in France.

Very truly yours,

E. O. SEICKE,
State Forester.

LEGISLATIVE INVESTIGATING COMMITTEE'S REPORT.

SUB-COMMITTEE ON HIGHER EDUCATION.*

The report is in part as follows:

The Agricultural and Mechanical College may be said to comprise three distinct divisions of agricultural activities. Its teaching of the agricultural sciences and mechanical arts; its investigation into the scientific problems of agriculture, and its field demonstration work conducted through the extension department.

The administrative divisions of the College are five in number. The School of Agriculture; the School of Engineering; the School of Veterinary Medicine; the main Experimental Station, with which the thirteen substations are correlated; and the Agricultural Extension Service, now conducted in cooperation with the United States Department of Agriculture.

It is doubtless true that a large part of the citizenship of the State has but small appreciation of the equipment Texas has established at College Station for the education of its younger men in the agricultural sciences and the mechanical arts. The inventoried value of the plant on August 31, 1917, was \$2,727,492.38. During the fiscal year 1916-17, the State appropriated for the College \$805,066.50, but at the end of the year had increased the investment of the State there by \$524,667.50, leaving as the net cost of the State for the year \$280,399. To this sum was added appropriations by the Federal Government, from the Morrill fund and the Smith-Lever act, amounting to \$124,250.73, making the net cost to the State and National Government for the year \$404,694.73.

There has been so much discussion concerning the per capita student cost of maintaining and operating our educational institutions that any statement concerning the cost necessarily must be accompanied by an analysis of the items of expenditures entering into the amount stated as the average cost. It has been a matter of much concern and of no little difficulty to the administrative authorities of the different institutions to explain differences in the cost of conducting different institutions. From a study of the question of items of expenditure accepted by college authorities throughout the country and by auditors handling the operative cost of institutions, the committee finds that there is practical unanimity in the items that should constitute an essential part of the student cost for each year and be absorbed into the operating expenses for the current school term. These include such items as necessary repairs and equipment found desirable for the proper conduct of the work of the school and essential to the teaching efficiency of the instruction. Such expenditures, though appropriated in connection with the general appropriations made for an institution as do not affect or enter into its teaching service, should not be included as a part of the operating cost of the instruction; in the case of the Agricultural and Mechanical College we find that the State Experiment Sta-

*This report is incorporated here for the information of the public.

tion, while a part of the college, located on and using college property, received an independent appropriation; but the Extension Service, which has nothing whatever to do with the teaching of intramural instruction, was provided for in the regular appropriation bill for the maintenance of the College. Expenditures for new buildings or additions to buildings should be understood as not expected to be absorbed in full as a part of the student cost of the school year during which the appropriations were made. Some policy should be adopted for charging an equitable proportionate part of such building appropriations only, in order that unjust comparisons may be avoided. Also expenditures for the maintenance of departments of the institutions, not connected with the teaching work and not properly chargeable to the operating cost for the student year, during which the appropriations are made, should not be included in the items entering into a necessary part of the maintenance expenses of an institution.

The committee secured from the Agricultural and Mechanical College a statement of the enrollment of the College and the distributed cost since 1876. In the forty-two years the College has been in operation it has enrolled 18,501 students in its full course classes. The Legislature has appropriated for the maintenance and support of the institutions during that time \$2,524,875; it has also appropriated in the same time for buildings and equipment improvements, \$1,936,068.69, making a total for the two purposes, 1876-1917, \$4,460,943.69. This would make the average cost per long session student including everything, \$241.12, for the whole period. Figuring the average cost for the whole period, per long session student, as represented in appropriations for maintenance and operative cost and not including buildings, equipment and improvements the cost is placed at \$135.93 for each of the forty-two years. Respecting the cost per student for the year 1916-17 including the building appropriations, \$406,150, a sum larger than ever received before at one time by the College, the cost including everything for that year would be \$563.33. This, it will be observed, provides for the absorption of the entire appropriation for permanent buildings into the operative cost for one school year. The cost for the year 1916-17 exclusive of buildings and based on salaries of teachers and incidental operating expenditures shows a student cost for the year of \$244.37. Included in this cost is the sum of \$37,500 derived from the Morrill fund. This does not include any part of the appropriations for the extension department of \$35,970 for the year ending August 31, 1916; nor any part of the appropriations of \$65,945 for the year ending August 31, 1917, which was embraced in the general appropriation made for the Agricultural and Mechanical College by the Thirty-fourth Legislature.

From a consideration of all these facts the committee is of the opinion that there is a principle that might guide in formulating the estimates of per capita cost of instruction in our own institutions of higher learning. That some accepted basis for arriving at such conclusions is highly important is attested by the fact that within the past few months the question of student cost in our higher educational institutions has been the subject of political controversy, the different conclusions finding their foundation in the differences of opinion as to what items properly

constitute a part of the maintenance and operative cost. All salaries for instruction and administration in connection with intra-mural teaching, laboratory supplies and other items of maintenance cost, as also ordinary repairs to buildings and equipment, and such expenditures as are made for new equipment not properly listed as a part of the building equipment, should enter into the aggregate sum-to be used as a dividend and the total number of long term students should constitute the divisor in this problem. The quotient obtained from these totals ought to fairly represent the per capita cost for instruction. It is the current practice to include the building appropriations in the aggregate sum. Your committee is of the opinion that the cost of permanent improvements should not be made a charge in the per capita cost of one particular year, but some principle should be devised for distributing this cost through a period of years that might reasonably represent the duration of the building for use for its particular purpose. Obviously items appropriated to an institution for investigation of extension teaching that might be discontinued at any time without affecting the teaching efficiency of intra-mural students, should not be included in aggregate sums used to arrive at per capita cost of instruction.

It is an interesting fact that this is one of the comparatively few schools of the country that have approximately held their attendance during the war period, the enrollment this year being only a little less than last year, but more than for 1915-16. As indicating the increased interest in agriculture among the students of the College, the records for the past twelve years disclose the fact that in 1906-07, with an enrollment of 537, 20.4 took the agricultural studies, while 79.5 took the engineering studies; each year thereafter shows a steadily increasing number of agricultural students, until in 1914-15 and 1915-16, a little more than 55 per cent out of an attendance of approximately 1000 took the agricultural courses; while in 1917-18, with an enrollment of 1108, 557 are agricultural students.

With a teaching staff of 102, the average number of hours given to actual teaching is eighteen a week, while the average number of hours a week for all college work, including teaching, but not including time spent in study or reading preparatory for class work, is 39.5. That vocational instruction is rapidly growing in popular favor is evident by the keen and increasing interest taken in the different branches taught at the College, the only exception being the Department of Textile Engineering, in which the attendance has been small since its establishment in 1903. The expense of the department is comparatively slight, however, and the committee feels that with the great possibilities for the development of textile industries in Texas, it is advisable to continue the effort to arouse interest in the subject through the training of men who may be serviceable in the establishment or operation of such enterprises.

The salaries of the Faculty of the Agricultural and Mechanical College are comparatively low, the average salary for the entire Faculty being approximately \$2000; and where work is done in the summer schools for short periods, no extra compensation is allowed. The last appropriation bill carried an item for salary readjustments for the

College of \$10,000, which was used to add to the pay of those receiving the smaller salaries, and being so distributed that the increase was from \$100 to \$300, only one or two receiving the latter sum. It is probably true that the College loses a larger percentage of its teaching force each year by resignation than any other institution in the State, due, it is claimed, to the active demand for capable instructors in vocational studies and the salaries paid being a contributing cause.

The College has 3000 acres of land, but to carry on its work in agriculture in connection with the State Experiment Station, and to maintain the live stock essential to proper instruction in animal industry, will need more territory.

The student body is drawn from practically all over the State and represents every class of business and social standing. There are forty students from other States, and four from other countries. The records of graduation indicate that the percentage of those who complete the courses and receive degrees compare very favorably with the average of the first class institutions throughout the country. The discipline under the present administration is good; and the spirit of democracy manifest in the student body is commendable.

In considering the future of this institution the committee would direct attention to the statements made before it by Hon. John J. Guion, President of the Board of Directors, and Dr. W. B. Bizzell, President of the College, as being well worthy careful thought, and which statements are a part of the record.

The functions of the agricultural research work are performed through the main experiment station located on the property of the College, but separate in organization. Under the control of the Main Experiment Station at the College are thirteen substations distributed over the State. The general scope of the experiment station service as now organized comprises investigation in the following twelve divisions: Veterinary Science, Chemistry, Horticulture, Animal Husbandry, Entomology, Agronomy, Plant Pathology and Physiology, Farm Management, Poultry Husbandry, Forestry, Plant Breeding and Dairying; and to which is to be added the Feed Control Service administered under the direction of the Main Experiment Station.

The Experiment Station is cooperating with the United States Department of Agriculture for various kinds of crop investigation work, and receives from the Federal government \$30,000 per year to support its work of crop experimentation and scientific agricultural research.

The Main Experiment Station is located on the lands of the Agricultural and Mechanical College and the main administrative building used by the Main Station for its various purposes are included in the inventories of the Main Station, which cover equipment only, with minor exceptions, therefore, represent the following items: Furniture and fixtures, machinery and tools, scientific apparatus, live stock and harness, chemicals and laboratory supplies, books and periodicals, feed-stuffs, money crops, stationery and office supplies, seeds for planting and miscellaneous. Included in the inventory for the Main Station are various items for small buildings especially adapted and necessary to the Main Station, the total of which inventory, including special build-

ings, amounts to \$58,678.16. These items of inventories are distributed among seven of the divisions of the Main Station, which comprise Chemistry, Horticulture, Agronomy, Entomology, Plant Pathology, Veterinary Science and Plant Breeding and Forestry.

In the inventoried assets of the thirteen substations of the Texas Agricultural Experiment Station service, the inventory embraces lands and buildings in addition to the other items embraced in the inventory at the Main Station. The detailed substation inventories are as follows:

No. 1, Beeville Station.....	\$ 17,325 50
No. 2, Troup Station.....	21,093 12
No. 3, Angleton Station.....	16,340 73
No. 4, Beaumont Station.....	14,850 06
No. 5, Temple Station.....	19,061 08
No. 6, Denton Station.....	29,854 68
No. 7, Spur Station.....	17,282 22
Sheep Breeding Station.....	8,439 89
No. 8, Lubbock Station.....	16,839 12
No. 9, Pecos Station.....	15,543 10
No. 10, Feeding and Breeding (at College Station).....	87,658 31
No. 11, Nacogdoches Station.....	11,591 70
No. 12, Chillicothe Station	12,208 59
No. 14, Sonora (for goats).....	27,832 90
Photographic supplies	440 79

Total of substation assets.....\$316,361 79

The work of the Main Experiment Station is being conducted with efficiency; and so far as the committee was able to ascertain from the reports of the work being performed by the substations, these stations are devoting their principal efforts to those crop experiments and other investigations best calculated to prove serviceable in the greatest measure to the respective localities in which each of such stations are situated. While substations are managed from the Main Experiment Station, they are under the control of a separate board. The committee cannot see any real necessity for a special substation board, although recognizing fully the active interest and intelligent efforts of the representative men who have been identified with the development of the substation service. It would seem that the supervision might be lodged in the Board of Directors of the Agricultural and Mechanical College, where it will be brought in close touch with the whole system of agricultural education, experimentation and farm demonstration. There is the same danger in the establishment of substations that is to be found in the creation of other State institutions; the call for them may exceed the need; and if the whole supervisory control of the main and the substations be placed in one body conversant with the requirements of agricultural activities of an educational nature there is less likelihood of an unnecessary multiplication of these stations.

The fact that the Main Experiment Station is under the Board of Directors of the College and the thirteen substations under a separate substation board, presents an important question of State policy. The

entire experiment station system is under the Director, who is appointed by the Board of Directors of the Agricultural and Mechanical College. Obviously, it is not sound administrative policy to create separate boards for the direction of the Main Station and for the thirteen substations. The entire experiment station system should be regarded as a unified division of the agricultural experiment activities of the College, and as such it should be closely correlated with other divisions of the institution. The committee understands complete harmony has prevailed between the Board of Directors of the College and the substation board, and that the latter board has contributed substantially to the successful development of the substation service, but the committee does not believe that such an organization represents the best administrative policy, and would recommend the entire system be placed under the active direction and control of the Board of Directors of the Agricultural and Mechanical College. If it be claimed that more intelligent interest has been manifested in the substation work by reason of its being under the direction of a small special committee of three members than might have proven the case with a larger committee, we would suggest that the same result may be achieved by the division of the Board of Directors of the Agricultural and Mechanical College, into subcommittees which, the full board having outlined the general policy and regulations, would devote special consideration to (1) agricultural education; (2) all agricultural experiment work, and (3) all agricultural extension work, each of said subcommittees reporting to the full board. Furthermore, if the State is to enter upon a policy of creating branch or junior agricultural colleges, there is still greater reason that all supervisory control respecting agricultural education, experimentation and demonstration be lodged in one governing body.

Respecting the feed control, administered by the Experiment Station, the service has been both efficient and economical, and under the present administration of the Agricultural and Mechanical College the fees collected have been devoted exclusively to the construction of needed buildings, adding materially to the equipment by this means. In any readjustment of the functions of governmental administration, however, in which duties educational in character are exclusively limited to those institutions organized and equipped for the purpose, and duties essentially executive in character are to be assigned to those departments of government charged with executive powers, the administration of the pure feed service now conducted under the direction of the Experiment Station of the Agricultural and Mechanical College would under an assignment along such lines, be transferred to the State Department of Agriculture. In view of the fact that the service requires special facilities to expeditiously and properly administer it, and that a building especially designed to meet the needs of the feed control and erected for that purpose at a cost of about \$30,000, is now nearing completion, the transfer would best not be attempted until such time as proper facilities for its reception and conduction have been provided for.

AGRICULTURAL EXTENSION DEPARTMENT.

In 1914, by a general memorandum of understanding, uniform in all the States, the Agricultural and Mechanical College agreed with the United States Department of Agriculture to organize and maintain a definite administrative division for carrying on practical instructions and demonstrations in all forms of agricultural industry and rural home economics, to be in charge of a responsible director, selected by the College authorities and acceptable to the Federal department; and that through this extension service all funds received for such purposes from congressional or legislative appropriations should be utilized.

The department has been extended in cooperation with the policies of the Federal government until at this time the organization comprises one director and one assistant director, twenty-five men and women specialists, one woman State agent in charge of girls' clubs, with one assistant and two district agents, nine men district agents, one negro in charge of the extension work among the negroes, with eleven assistants, 135 county agents, thirty-nine assistant county agents, thirty-six women county agents, with five women assistant county agents.

The extension service is supported by Federal, State and county funds, with an occasional contribution by the public spirited organizations. The total fund that will be available for expenditure, through this department, in the year 1917-18, is \$556,719, made up as follows:

United States Department of Agriculture direct appropriation.	\$ 67,000
Federal Smith-Lever	105,000
War emergency	147,000
Commissioners courts	121,809
Business organizations	20,910
State Smith-Lever (Legislature of Texas).....	95,000
<hr/>	
Total	\$556,719

From this statement it will be seen that the State is receiving liberal Federal appropriations for the work, and since the general plans, in conformity with which the extension service is conducted, is largely a matter of the Federal suggestion and approval, the committee feels little is left for comment, except the very important question of duplication of the extension work.

Adhering to the fundamental principle involved in what has been considered a wise division of the functions of the public service, it would appear conclusive that the State Department of Agriculture is now expending a considerable amount of money for work that is educational in character, such as the institute work, the last appropriation for which exceeds \$30,000, and which is largely a duplication of the county agents' work of the agricultural extension service. It would seem that experience has demonstrated the ineffectiveness of the lecture plan alone in conducting agricultural extension; results are only practicable through actual demonstrations with the farmers, consistently followed up in accordance with a systematic plan. In addition, the State Department of Agriculture maintains various special services, as that for the im-

provement in live stock and dairying, nut specialists, plant pathologists, etc., which constitute duplications of work being done through the agricultural extension service, and which the committee believes could be discontinued without disadvantage to the public service. The committee would recommend, therefore, the complete revision of the statutes defining the work of the State Department of Agriculture, and believes the expenditures of that department may be reduced by a sum not less than \$50,000 without injury to the legitimate requirements of the public.

By agreement, the home economics work of the extension department of the university is largely confined to towns and cities, leaving the rural home economics work to the extension service of the Agricultural and Mechanical College.

The committee does not feel justified in leaving the question of duplication of effort with its attendant results, without directing attention to the fact that in work of the nature of this agricultural extension service duplication may be of two kinds, viz., duplication from without, as that just referred to by the State Department of Agriculture; and from within, as for instance, taking the county demonstration agent system, which is a practical one promising the greatest measure of efficient results, and imposing upon it too many district agents and special field agents and other special workers. The opportunity for overloading the system is apparent and only strong and judiciously directed management will prevent expenditures in this direction without the realization of commensurate results.

FUTURE POLICY.

The educational policy of the State, so far as that policy has been indicated through the establishment and equipment of schools and colleges, has assigned to the Agricultural and Mechanical College of Texas the field of vocational instruction in agriculture and its necessary divisions; and has assigned to it coordinate duties in vocational instruction in the several branches of engineering. Accompanying vocational agricultural instruction and education in the agricultural sciences, is the study of live stock as embraced in the broad term of animal husbandry.

The great extent of the State and the wide diversions of soil and climatic conditions, and the tremendous growth of agricultural and live stock interest in recent years, has brought a demand for the establishment of more widely distributed facilities for instruction in agriculture and animal husbandry. The question has even been made a political issue to the extent of the Democratic convention of 1916 declaring for the establishment of a "branch" agricultural and mechanical college west of the ninety-eighth meridian. It is unnecessary here to make more than a mere reference to the legislative action in not only attempting to comply with this suggestion for the branch college in Northeast Texas, and to the actual authorization of two schools designated by statute as junior agricultural and mechanical colleges, under the direction and control of the Board of Directors of the Agricultural and Mechanical College of Texas.

The question thus raised, in the proposed creation of a number of junior schools, not only presents the problem of the popular desire for increased facilities in vocational instruction in agricultural and kindred subjects, but also presents a problem of the first importance concerning the further development of the Agricultural and Mechanical College and its measure of usefulness to the State.

Great as is Texas, we do not feel that this sentiment for increased vocational instruction should ever be interpreted to mean the creation of another State Agricultural and Mechanical College, giving like complete courses of instruction and education in the arts and sciences. The thorough equipment for instruction in engineering studies at the university affords, with that of the Agricultural and Mechanical College, all the facilities likely to be required for vocational instruction in engineering branches. The committee would commend the policy of establishing a sufficient number of branch agricultural colleges, not exceeding six, including the two institutions now established; no two of which should be created within any biennium, geographically distributed to meet as nearly as might be the actual climatic and soil conditions of the State, the scope of work at which institutions should be limited to agriculture and animal husbandry and the arts and sciences connected therewith, and answering in greatest measure to the particular requirements of the respective sections of the State where located. The official status and scope of educational activities to be accorded these institutions would best be that assigned to junior colleges. To assure that the agricultural and live stock needs of the State shall be subserved in the fullest measure for the promotion of the popular welfare, it is the fixed conclusion of the committee that the authority for the establishment of these junior schools, their general geographical location, and the limitation on the time when they are to be created, should be written into the Constitution, to the end that something approaching a definite and intelligent policy with reference to the provisions for the educational agencies may be pursued. To incorporate these restrictions as to character of work, number, location, and time of creation, of these institutions in the Constitution, is the only way to insure against recurring revulsions in the distribution of State patronage in the guise of providing educational facilities for which there is no present or immediately prospective need, and wholly without consideration of the legitimate requirements of the people in the development of a judicious and well coordinated State educational policy.

While the division of the university endowment fund, with authority for the governing boards of the Agricultural and Mechanical College to use its part of the permanent endowment as the basis for a bond issue to provide for the construction of permanent buildings, would immeasurably relieve the State from the necessity of making appropriations from the general revenues for buildings at the College, the amount of the endowment that will be available under any such division would not be sufficient to, at any time, care for the construction of necessary buildings and permanent equipment of the new junior agricultural schools. The need will be appreciated, therefore, of creating

these school only as population and the volume of property valuation subject to taxation increase, as the needs develop and the revenues justify.

An intelligent appreciation of the certainty of the State extending the policy of junior agricultural schools, with attendant demands for buildings impresses upon the people the necessity of providing at the earliest practicable date for the utilization of the permanent endowment fund of the university and its branches in conformity to some businesslike plan calculated to reduce the cost of equipping the main institutions at Austin and College Station with the buildings they now need and will require from time to time.

The administrative authorities of the Agricultural and Mechanical College have outlined their estimate of the needs of that institution for buildings covering the next ten years, and places such estimate for that period at approximately \$2,500,000, and this, too, in the expectancy of the State adopting the policy of junior agricultural schools teaching agriculture and animal husbandry which will in some measure restrict the ratio of increased attendance at the College. To this sum must be added an estimate for the decennium of approximately \$500,000 to \$750,000 for permanent improvements at the Prairie View Normal and Industrial College for colored youths.

The committee does not believe this estimate at all excessive; and further believes the general policy pursued heretofore of erecting buildings especially designed for departmental service preferable to the construction of fewer and larger structures intended to accommodate unrelated departments, as calculated to secure more advantageous results. No discussion of the building requirements of the Agricultural and Mechanical College would be complete without consideration of the needs of the institution in provisions for the housing of members of the Faculty and administrative officers and employes.

College Station is isolated, a town to itself, the city of Bryan being five miles distant with means of communication being too inadequate to render residence in Bryan agreeable to those who must give the whole of their time to the College. It is probably true that the College loses as many good men from the service because of unsatisfactory housing conditions as from any other cause. The committee is convinced that it will be a wise policy to provide for the erection of a sufficient number of residences to accommodate the members of the Faculty, administrative officers and employes. There are now about sixty residences owned by the College, and it is estimated that thirty more are needed. All occupants of College residences should pay a proper rental, salaries being adjusted upon this basis. The present buildings are of frame construction and yield an average rental of \$240 a year, a sum sufficient to meet costs of repairs and provide a surplus of approximately one-third the income. Future residence buildings would best be of hollow tile construction, and while costing a little more, would require less for maintenance and be far more durable. The committee believes that with a revolving residence building fund of \$100,000 the rental income would be sufficient to provide for maintenance and for all future additional buildings required by the growth of the institution.

The activity of the Federal government is stimulating agricultural production in all its branches, particularly with reference to the research work conducted under the Experiment Station, and the agricultural extension work throughout the country, as expressed in recent years through congressional appropriations, represents the establishment of a national policy certain to grow more comprehensive from year to year; and the policy of working in conjunction with those institutions in the different States performing like functions to those of the Agricultural and Mechanical College of Texas indicates a constantly increasing popular usefulness and prestige for this institution. Vocational instruction in the arts and sciences embodied in the scope of educational activity of this College is growing fast in public favor indicating rapidly growing demands upon the facilities provided to meet such requirements. The committee feels, therefore, that it is incumbent upon the State, as one of the great agricultural States of the Union, to deal with this College in accordance with a broad, progressively constructive policy, calculated to add effectively through its work in the development of what is rapidly taking form as a great national policy of industrial education.

In the State Agricultural and Mechanical College, Texas may justly claim possession of one of the most progressive colleges devoted to vocational instruction in the Union. It is neither as large nor is its equipment as good as a number of similar institutions in other States, but the spirit and policy may be confidently asserted as second to no college in the country covering the same field.

The Agricultural and Mechanical College is in first class condition.

There is some effort being made to remove from the Agricultural and Mechanical College the Feed Control Service, which, in my judgment, would be very unwise, inasmuch as the Agricultural and Mechanical College has conducted that department to the satisfaction of the public and at the same time they have a new Experimental Station building, equipped with proper laboratories adequate to take care of the department and maintain it in its present high standard of efficiency and it will be a great mistake to remove it, and at the same time it will be quite an additional cost to the State to put the Pure Feed Control under any other department, and it would be my recommendation that the Feed Control Service be left with the Agricultural and Mechanical College.

I would further recommend that all the agricultural instruction of every character and all administrative duties and work, including nursery inspection and other similar administrative duties, and animal industry of every kind be put under the Agricultural and Mechanical College, thereby stopping duplication of the different departments of the State.

DR. I. E. CLARK,

Chairman, Senate Committee No. 9.

Austin, Texas, January 16, 1918.

REPORT OF SUPERINTENDENT OF POWER PLANT.

September 1, 1918.

President W. B. Bizzell, College.

SIR: I beg leave to submit herewith my report of the operation of the power plant of the College for the years 1916-18.

The past two school years ending August 31, 1918, have been especially trying ones for the management of the power plant, as it has been a constructive period, also one which has seen considerable change in the personnel of the engineers and other workers.

Early in the spring of 1916 the work of constructing the much needed new power house was begun. It was necessary to dismantle the old temporary building and erect the new building over the machinery installed, and provide for the continuous operation of the plant at the same time. The machinery was successfully operated throughout the trying period and furnished service to the College with but few interruptions. The building was finally completed at a total cost of \$66,150, and gives proper housing to the valuable machinery therein.

During the two years the following new equipment has been added to replace worn-out machinery and to meet the increasing demands made on the plant for power, light, heat and water supplied by it to the College:

One 306 horse power water tube boiler with setting, piping and breeching	\$ 4,250 00
One 200-foot concrete stack.....	5,253 00
Breeching to connect old and new boilers to stack.....	1,664 00
One Turbo centrifugal pump for water system.....	775 00
One 10x6x10-inch steam boiler feed pump.....	250 00
Concrete water storage tank, capacity 187,700 gallons, and connecting water mains.....	3,454 00
Concrete fuel oil storage tank, capacity 2915 barrels.....	3,139 00
Concrete well house.....	400 00
Air driven condenser tube cleaner.....	83 00
Oil saving and waste washing machine.....	150 00
Chlorinating apparatus for water system.....	451 00
A traveling bridge crane for engine room.....	427 00
A 125 k. w. Turbo generator.....	5,126 00
Exhaust mains and piping made necessary by changes in new plant	857 00
Early in the spring of 1917 a contract was made with Layne & Bowler of Houston, Texas, for drilling and equipping a 400,000-gallon water well. Contract price complete with electric motor driven pump, \$7850. This well has not been accepted as its capacity has never been brought up to specifications, although it has been in use intermittently by the College for nearly one year. Amount advanced to contractors of well by College to date.....	4,875 00

Total permanent additions to equipment for the years
1916-18\$31,154 00

The statement of the operating expenses of the power plant are given as follows:

Year 1916-17:

Salaries and wages.....	\$ 8,408	76
Fuel, oil and lignite.....	25,854	07
Wood for heating building (the greater part of wood used was paid for out of funds of the year 1915-16).....	81	00
Repairs, lubricating oil, waste and other consumable supplies	2,023	97
New equipment	440	85
Freight	141	90
Total	\$36,950	55
Sales, water supplied to outsiders and material to departments of College	1,509	26
Net cost of operating expenses.....	\$35,441	29

Year 1917-18:

Salaries and wages.....	\$14,760	86
Fuel oil and lignite.....	39,650	35
Wood for heating buildings and use at incinerator.....	1,067	74
Repairs, lubricating oil, waste and other consumable supplies	3,788	84
New equipment	7,108	38
Freight	378	43
Total	\$66,754	60
Sales, water supplied to outsiders and material to departments of College and others.....	1,705	31
Net cost of operating expenses.....	\$65,049	29

The heavy increase in operating expenses for the year 1917-18 is due to the following factors:

- (a) Increased cost of labor.
- (b) Increased cost of fuel and supplies.
- (c) Cost of necessary equipment added during the year and repairs.

Respectfully submitted,

HARRY E. SMITH,
Superintendent Power Plant.

REPORT OF COLLEGE LAUNDRY.

September 1, 1918.

To the President of the College.

SIR: I herewith submit my report for the years 1916-17 and 1917-18 on the work and improvements of the College laundry.

From September 11, 1916, to the close of the school year, June 1, 1917, the number of pieces laundered for cadets, College departments and campus people amounted to 644,027 pieces, or an average of over 64,400 pieces per month. During the first six months of the school year of 1917-18, 392,840 pieces were laundered, or an average of 65,473 pieces per month.

The cost of operating the laundry for the year 1916-17 is as follows:

Salary of manager and other labor.....	\$ 7,855 92
Consumable supplies, repairs, etc.....	3,548 03
Freight	100 11
New equipment	1,155 23

Total	\$12,659 29
Receipts from student maintenance fund.....	\$8,199 92
Sales and collections from campus and departments of College.....	4,279 78
	<u>12,479 70</u>
Deficit for year.....	\$ 179 59

The operating cost for the year 1917-18:

Salary of manager and other labor.....	\$10,276 80
Consumable supplies, repairs, etc.....	5,153 57
Freight	201 34
New equipment	2,280 68

Total	\$17,912 39
Receipts from student maintenance fund.....	\$6,830 74
Sales and collections.....	8,817 84
	<u>15,648 58</u>
Deficit for year.....	\$ 2,263 81

Average cost of laundering per piece for year 1916-17.....	1.96 cents
Average cost for year 1917-18, based upon the average output per month for six months.....	2.28 cents

The considerable increase in cost per piece for the year 1917-18 is due largely to the very great increase in cost of supplies and labor.

The above costs would be appreciably increased, if the cost of power,

steam and water supplied to the laundry by the College power plant were added to the operating expenses of the laundry.

During the latter part of the year 1917-18 the College contracted with the government to do the laundry work for the drafted men at the College. This work proved to be far beyond the capacity of the plant and a considerable portion of the work had to be sent to Houston laundries, which resulted in financial loss. Had the College been able to get the new equipment ordered in time to meet the demand, the financial showing for this year would have been much improved.

With the present price of laundry supplies and the increased wages demanded by employes, it is impossible to continue the present very cheap rates given to students and drafted men, without considerable loss to the College.

The laundry has operated under very crowded conditions, and it has with difficulty been able to meet the demands made upon it by the College.

In spite of this handicap the quality of the work turned out has compared very favorably with that done by other laundries of the State.

Respectfully submitted,

HARRY E. SMITH,
Superintendent Power Plant.



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